

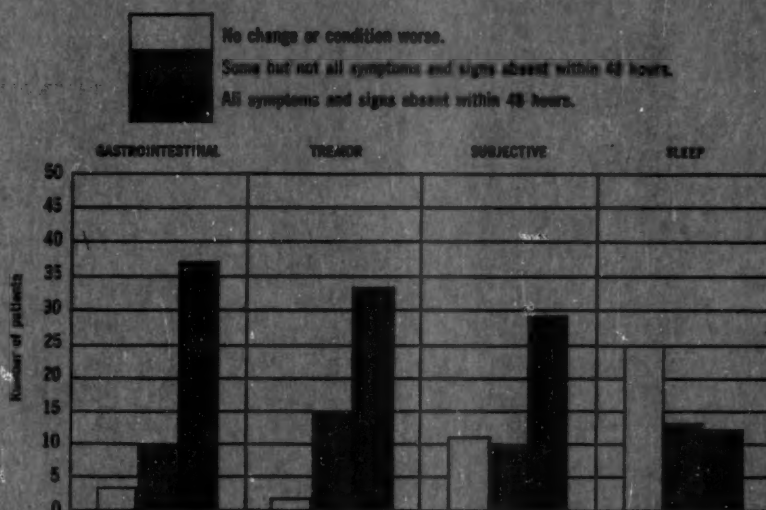
THE AMERICAN JOURNAL *of* PSYCHIATRY

**VOLUME 109
NUMBER 12
JUNE 1953**

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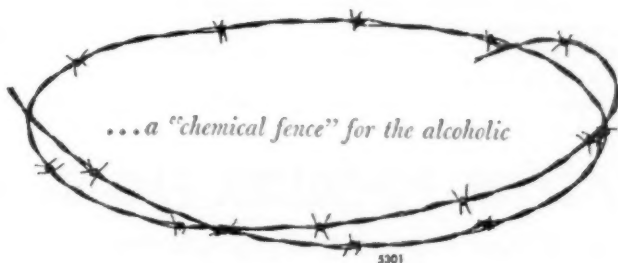
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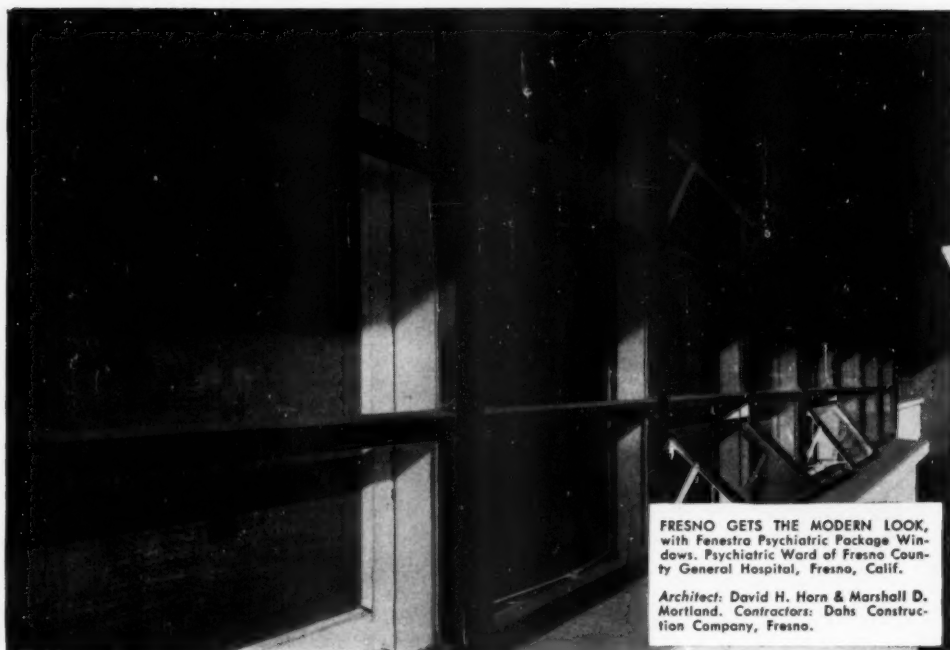
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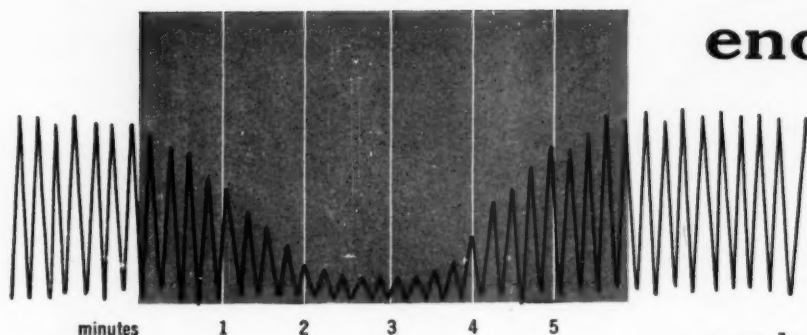
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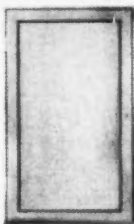
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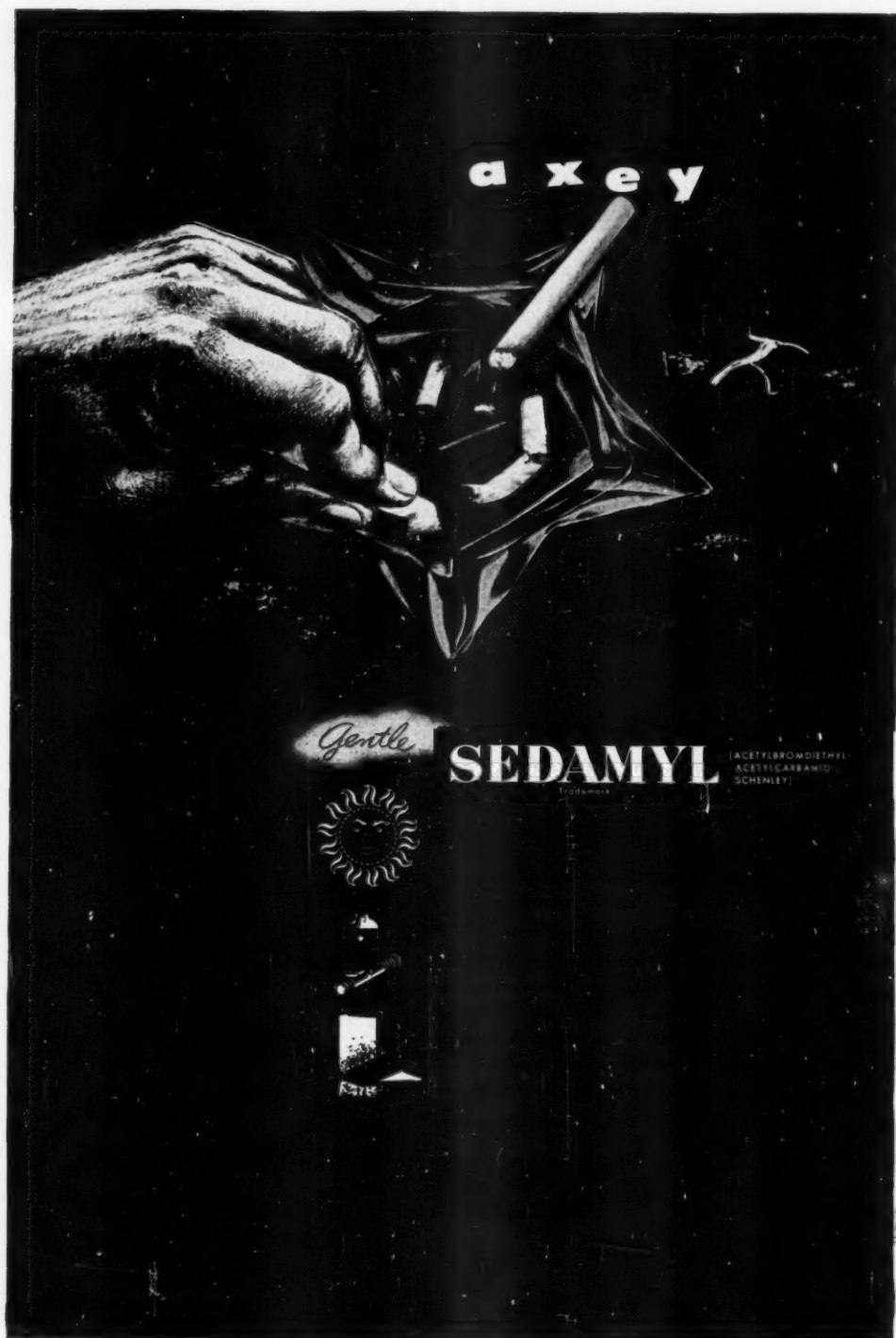
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DORMISON, A NEW TYPE OF HYPNOTIC

ITS THERAPEUTIC USE IN PSYCHIATRIC PATIENTS¹

PHILIP R. A. MAY, M.D., AND FRANKLIN G. EBAUGH, M.D., DENVER, COLO.

Dormison (methylparfynol) is a new type of hypnotic that, unlike other hypnotics in common use with the exception of paraldehyde, contains only carbon, hydrogen, and oxygen and is not related to the opiates, the barbiturates, or chloral hydrate. It resembles paraldehyde in being a liquid aliphatic nonhalogen compound with the same number of carbon atoms, but is otherwise not related to it. Pharmacologic studies(1) show that Dormison has a high margin of safety—the lethal dose in rats (L.D.50) is approximately 80 times the effective dose in man, and respiratory depression is not produced in dogs by doses corresponding to 70 times the effective dose in man. It is short acting and rapidly metabolized (after intravenous administration to dogs no drug could be detected in the blood after 2 hours), readily inducing a calm, peaceful sleep without after-effects. Hirsh and Orsinger(2) suggest that in view of its rapid metabolism by the tissues Dormison must produce its effect primarily by initiating natural sleep and that the duration of sleep depends upon other factors; however, this cannot be the entire story, as they report that increased dosage produces longer sleep. In acute and chronic toxicity tests no organic tissue or metabolic pathology due to the drug could be detected and no undesirable effects were noted. Dormison has a highly specific hypnotic effect: even large doses did not produce anesthesia, analgesia, antispasmodic activity, vasomotor, cardiac, or respiratory depression. However, animal experiments have shown that Dormison has a tremendous potentiating effect on sodium pentobarbital. When the 2 drugs were given simultaneously, the animal remained in deep sleep for 24-48 hours, whereas with the same dose of sodium pentobarbital without Dormison the effect would last only 4-6 hours. Not only were the hypnotic and anesthetic effects

of the barbiturate increased, but the general depressant effect on respiration was also accelerated.

Preliminary clinical reports of the use of Dormison(1-5) have confirmed its efficiency, rapid onset of action, and relative freedom from side-effects. Hirsh and Orsinger(2) report that 78% of 195 patients receiving doses of 100-500 mgm. went to sleep within 2 hours and that 86% of 120 patients slept for 5 hours or more. Best results were obtained with doses of 300-500 mgm; of those given 500 mgm., 93% were asleep in 1 hour, and 97% in 2 hours; 92% slept 5 hours or more. Side-effects were noted in only 8 of 195 patients: 5 complained of hangover, 2 of nausea, and 1 of a bad taste in the mouth. There were no other toxic effects. They concluded that Dormison is most effective in simple insomnia and less effective in anxious, agitated, and disturbed patients or in those with pain, cough, or a febrile illness. Both they and Allen and Krongold(4), who reported similar results in an earlier smaller series, used doses up to 800 mgm. Gangemi(3) also obtained good results without toxic effect, but found it necessary to give higher doses to some of his patients; he gave 1.00 gram to a patient with arthritis, 1.25 grams to a drug addict, 1.5 grams in 6 cases of nervous tension or alcoholism, 1.5 grams to a patient with coronary thrombosis, and 2.0 grams to a patient with pyelitis.

These previous reports have dealt mainly with mixed groups of patients with organic disease or with milder psychiatric disorders: there are few accounts of experience with the more severe psychiatric disorders. Hirsh and Orsinger(2) gave single doses of 200-800 mgm. to 81 patients with acute alcoholism, delirium tremens, and other acute psychiatric or agitated and disturbed states "primarily for the purpose of demonstrating the safety of large doses of the drug." All patients slept 3 to 8 hours except those with delirium tremens, in whom no effect was noted. Gangemi(3) obtained good hypnotic results in 2

¹ From the Department of Psychiatry, University of Colorado School of Medicine.

Dormison was kindly supplied by the Schering Corporation of Bloomfield, New Jersey.

cases of delirium tremens with a dose of 1,250 mgm., and he also tried the drug in 3 patients with cerebral arteriosclerosis, abandoning it when 2 of the 3 became excited after single doses of 250 mgm. However, he noted that the excitement may have been coincidental, as these patients had been excited from time to time before they were given Dormison. He also used Dormison as a sedative in 64 patients including 11 with psychiatric diagnoses such as nervous tension and alcoholism, employing doses of 250-400 mgm. 4 times a day for periods of up to 80 days. The results on the whole were variable, although satisfactory in the psychiatric cases. In particular the drug controlled the severe tremors in 2 cases of delirium tremens. Drowsiness and dizziness developed in 30% of those given Dormison as a sedative, appearing only in those given the drug for more than 4 days, and 6% developed signs of gastric irritation.

All the previous reports, with the exception of that of Hirsh and Orsinger(2), are unsatisfactory for the purpose of comparison in that results are recorded as "satisfactory" or "good" without any definition as to exactly what is meant by these terms. Hirsh and Orsinger(2) attempted to evaluate the quality, rapidity of onset, and the duration of the sleep produced but, as they themselves point out, the figures they present are open to question as they depended essentially upon the patients' own evaluation, although this was supported in most instances by the opinion of a doctor, nurse, or member of the family. They defined a good night's sleep as 5 to 8 hours and recorded most of their results in terms of actual number of hours' sleep; but they record as "good" the effects of 500-mgm. doses given to acutely disturbed patients in whom sleep lasted 4 to 5 hours and they report the duration of sleep in 48 patients with acute alcoholism as 3 to 7 hours, a category that would seem to be too exclusive to permit proper evaluation. In none of the reports is there any comment on the consistency of results obtained with successive doses. Comparison with other hypnotic drugs, apart from comparison of side-effects, is also unsatisfactory as neither the doses compared nor the conditions of comparison are stated: the most precise is that of Hirsh and Orsin-

ger(2) who compared the effect of Dormison in 58 instances with 5 commonly used barbiturates and with paraldehyde: they comment that Dormison compared favorably or was found to be superior in 48 of 58 instances "in the usual doses."

PRESENT INVESTIGATION

COMPOSITION OF THE TEST GROUP

It is apparent from the preliminary reports that short action, freedom from side-effect, low toxicity, and freedom from stupeficient action are potential advantages that might make Dormison extremely useful in psychiatric practice. Accordingly, Dormison was tested as a hypnotic in those psychiatric patients where barbiturate administration might be regarded as hazardous and where paraldehyde would normally be used by most psychiatrists, and also in other unselected patients. All patients were in a psychiatric hospital during the time of administration of the drug, a majority being on the disturbed wards. Altogether the test group comprised 150 patients; the average number of trials for each patient was 7.5 and the average total dose per patient was 8.97 gm. The dosage range tested was from 0.25 gm. to 2.5 gm.

The drug was also tested as a sedative in 29 patients where paraldehyde would otherwise have been used as a sedative (15 patients with chronic alcoholism with tremors, 8 with delirium tremens, 2 drug addicts with severe withdrawal symptoms, 3 disturbed schizophrenics, and 1 severe anxiety state with psychopathic behavior). The dosage range was .25-2.0 gm., and a total of 220 doses was given.

METHOD OF ADMINISTRATION

Dormison is available in 250-mgm. capsules and as an elixir containing 62.5 mgm./c.cm. At present no form is available for parenteral administration and this study does not include patients who refused to take oral medication. Elixir was used almost exclusively for the following reasons: (1) It is taken more easily than capsules by elderly persons. (2) It permits more flexible variation in dosage. (3) A large dose may be given as easily as a small one: it is impractic-

cable to give large doses of Dormison in capsule form because of the large number of capsules that would have to be taken (e.g., 2.00 gm. equals 8 capsules). (4) Psychiatric patients occasionally keep capsules in their mouth and spit them out later; they may even be saved for a suicidal attempt. Use of elixir eliminates these problems.

Capsules were given only when elixir was not tolerated. Orders were written to allow "repeat doses" to be given once or twice during the night, as required, but an attempt was made to adjust the dose so that an optimum result would be produced without them. Table 2 includes data as to how often repeat doses were required.

Because of the possible danger involved, no barbiturates were given to patients taking Dormison: an additional study is being made at this medical center of the synergistic effects of Dormison and barbiturates.

DETERMINATION OF ONSET AND DURATION OF SLEEP

A "sleep chart" from 9 p. m. to 6 a. m. was kept for all patients: a nurse checks every half hour and if the patient is awake, the corresponding half-hour period is blocked in as "awake." Sleep after 6 a. m. or before 9 p. m. is not recorded, so that actually a patient may be asleep for longer than the hours shown in the "sleep chart." Wherever possible, this objective evaluation was checked against subjective evaluation by the patient.

CLASSIFICATION OF THE HYPNOTIC EFFECT OF EACH TRIAL OF DORMISON

The hypnotic effect of each dose was classified as good, fair, or poor according to the following criteria:

1. *Good*: More than 6 hours' sleep: if a dose was given too late in the night to permit 6 hours' sleep, a duration of $5\frac{1}{2}$ hours was classified as good if the patient went to sleep within an hour and slept without waking till 6 a. m.

2. *Fair*: 4 to 6 hours' sleep.

3. *Poor*: Less than 4 hours' sleep. However, if the patient was not asleep within 2 hours, the result was classified as "poor" regardless of the duration of sleep.

4. The duration of sleep was measured from the time at which the Dormison was given, *i.e.*, hours of sleep, if any, before giving Dormison were not included.

CLASSIFICATION OF THE GENERAL EFFICIENCY OF A PARTICULAR DOSE OF DORMISON

In estimating the efficiency of a hypnotic drug, one must take into account not only the optimum result but also the consistency with which this result is achieved. The general efficiency of a particular dose of Dormison in a particular patient was classified according to the following criteria:

1. *Highly efficient*: No poor results: 90% or more good results.

2. *Efficient*: 80% or more good results.

3. *Moderately efficient*: 80% or more good or fair results.

4. *Unsatisfactory*: Anything less than moderately efficient, or any case where the action was irregular with varying dosage.

DORMISON AS A HYPNOTIC

GENERAL COMMENT

Tables 1 and 2 show the relationship between diagnosis, dosage, and effectiveness of the drug. As might be expected from experience with other hypnotic drugs, larger doses of Dormison are required in psychiatric patients, especially in the severely disturbed, *e.g.*, patients with delirium tremens, alcoholism with tremors, schizophrenia, mania, and drug addiction with withdrawal symptoms. Since 99% of patients respond to doses of 2.5 gm. or less, this may be regarded as the maximum dose: contrary to expectation, patients over 80 required much the same dose as younger patients diagnosed as senile psychosis or cerebral arteriosclerosis.

In general, Dormison proved to be a safe, efficient, nontoxic hypnotic for psychiatric patients of all types, with distinct advantages over other types of hypnotics. In only one category was Dormison only partially effective: in the 5 patients with delirium of various causes. These patients were all between the ages of 50 and 70, and severely ill, 4 in what was virtually a terminal delirium and the fifth having bilateral lobar pneumonia with pleuritic pain. Relative failure in this

TABLE 1

PERCENTAGE OF CASES WITH EFFICIENT OR HIGHLY EFFICIENT RESULTS

Note:

(1) The figure in each column shows the percentage in which that dose (or a lower dose) would produce an efficient or a highly efficient result, based on the maximum dose given to each patient.

(2) All figures have been reduced to the nearest whole figure % to facilitate comparison. This in no way indicates that the authors are not aware of the dangers of attaching too much significance to % figures in small groups.

(3) The figures have been corrected to allow for those cases where trial over the full dosage range was not possible.

Diagnosis	No. of cases	Dormison dose (gm.)									
		.25	.5	.75	1.0	1.25	1.5	1.75	2.0	2.25	2.5
Chronic alcoholism	9	..	0	44	89	..	..	..	..	..	..
Chronic alcoholism with tremors.....	32	..	3	19	30	36	57	93	100	..	..
Delirium tremens	10	..	0	10	20	..	50	70	100	..	..
Senile psychosis and psychosis with cerebral arteriosclerosis	38	3	5	28	50	70	83	96	100	..	..
Schizophrenia	21	5	10	24	40	59	..	80	..	..	100
Mania, hypomania	6	..	0	0	20	50	..	..	..	100	..
Depression	6	..	0	20	..	50	75	..	100	..	..
Delirium of various causes.....	5	..	0	0	0	0	0	0	0	..	..
Epilepsy with psychosis.....	4	..	..	50	75	..	..	100	..	..	..
Acute posttraumatic psychosis.....	2	..	..	..	50	..	..	..	..	..	50
Drug addiction	5	..	0	20	40	..	60	..	..	100	..
Psychoneurosis	13	0	0	17	60	80	90	..	..	..	..
All diagnoses	150	1	3	22	42	54	68	86	92	97	99

TABLE 2

DOSE OF DORMISON PRODUCING EFFICIENT OR HIGHLY EFFICIENT RESULTS IN 50% AND 75% OF CASES

Note:

Figures were obtained from graphs of % results plotted against Dormison dose.

Diagnosis	No. of cases	Dose producing efficient or highly efficient results (gm.)		Repeat dose optimum required for result. *	
		In 50% of cases	In 75% of cases	% of cases	No. of nights required
Chronic alcoholism	9	.78	.93	22	1 in 4
Chronic alcoholism with tremors.....	32	1.40	1.62	38	1 in 2.3
Delirium tremens	10	1.50	1.85	50	1 in 1.9
Senile psychosis and psychosis with cerebral arterio-sclerosis	38	.95	1.33	18.4	1 in 3
Schizophrenia	21	1.13	1.61	14.3	1 in 3
Mania, hypomania	6	1.25	1.91	33	1 in 7.5
Depression	6	1.50	1.11	20	1 in 8.5
Delirium of various causes.....	5	†	†	60	1 in 2
Epilepsy with psychosis.....	4	.75	1.0	25	1 in 1.3
Posttraumatic psychosis	2	1.0	..	50	1 in 1
Drug addiction	5	1.25	1.88	80	1 in 1.8
Psychoneurosis	13	.91	1.18	38.4	1 in 8
All diagnoses	150	1.16	1.60	30	1 in 3

* Figures in this column should be interpreted as follows—e.g., chronic alcoholism—22% of cases required a repeat dose for an optimum result 1 night in 4, on the average. The remaining 78% never required a repeat dose.

† No efficient results, 1.5 gm. produced 50% moderately effective results. 2.0 gm. produced 75% moderately effective results.

group is hardly surprising; hypnotic drugs are seldom very effective in this type of case and indeed in 3 of the 5 cases the effect of Dormison was compared with that of Sodium Amytal and paraldehyde, neither of which produced better results. In senile and arteriosclerotic patients, Dormison produced excellent results, with no toxic effects, in striking contrast to clinical experience with barbiturates. In our opinion, Dormison is unquestionably the hypnotic drug of choice for these patients.

SIDE-EFFECTS

1. "Hangover."—Two patients (1.3%) complained of hangover, without objective signs. One patient (.67%), a severely disturbed 67-year-old man with delirium associated with chronic pemphigus and metastatic carcinoma, tolerated single doses of 2.0 gm. satisfactorily, but was objectively drowsy on the morning after it had been necessary to give 2 doses of 2.0 gm. to produce a good night's sleep. The next night he was given paraldehyde: 2 doses of 8 c.cm. were necessary to produce a good night's sleep and there was the same degree of drowsiness the next morning as had resulted from Dormison.

2. Taste.—When capsules were given, nobody complained of taste at the time of administration or after. Of those taking elixir, approximately one-third liked the taste, one-third were indifferent, and one-third found it mildly disagreeable, but tolerated it. An 87-year-old man said the elixir burnt his throat, but preferred it to any other hypnotic—he had had extensive experience elsewhere.

3. Gastric Irritation.—Six patients (4%) vomited single doses of elixir: 4 of those had vomited on other occasions both before and after the particular dose of Dormison, and the other 2 had complained of nausea due to alcoholic gastritis. All six were able to retain subsequent doses. One patient (.67%) who had not had previous symptoms of gastric irritation became nauseated when given elixir, but did well when given capsules.

COMPARISON WITH OTHER DRUGS

The effect of Dormison could be compared with that of Sodium Amytal in 57 instances,

and with paraldehyde in 12 instances. A comparison was accepted as valid only if the drugs compared had been given on consecutive nights or on a series of consecutive nights, and if there had been no particular change in the patient's psychiatric condition over the period of comparison. The results of sedation on the first night in hospital were excluded from comparison for obvious reasons. Apparent equivalent doses are shown in Table 3.

There was a close correspondence between the hypnotic effects of Dormison and those of the equivalent dose of Sodium Amytal: however, doses of Dormison did not show the hangover effects of Sodium Amytal, a feature that was especially prominent when large doses were compared. Dormison was given with good results and without toxic effects to elderly, arteriosclerotic, and senile patients in

TABLE 3
APPARENT EQUIVALENT DOSES OF DORMISON, SODIUM AMYTAL, AND PARALDEHYDE

Dormison (gm.)	Sodium Amytal (gm.)	Paraldehyde (c.c.m.)
.75	.2 (P.O.)	..
1.0	.25 (I.M.)	6.0
1.5	.4 (P.O.)	9.0
1.75	.5 (I.M.)	..
2.0	..	12.0

whom the use of barbiturates would normally be regarded as contraindicated or at the best hazardous. The dangers of barbiturate administration to these patients are too well known to merit further discussion here.

Comparison between hypnotic effects of paraldehyde and Dormison was less consistent, perhaps because of the smaller number of cases and because such comparison was invariably made in extremely disturbed and difficult patients. The equivalent doses shown in Table 3 must therefore be regarded as purely tentative. In one patient, a 42-year-old man with prolonged, severe, posttraumatic delirious reaction, Dormison in a dose of 2.5 gm. (repeated twice) was ineffective: there was no response to Sodium Amytal 5 gm. (I. M.), repeated once, but paraldehyde in 8.0 c.cm. doses was effective, although the dose had to be repeated once or twice during the night. In another case 8.0 c.cm. paraldehyde had the same toxic and hypnotic effects

as 2.0 gm. Dormison. On the other hand, in the 3 patients in whom comparison was made between Dormison 1.0 gm. and paraldehyde 8.0 c.cm., Dormison was superior. When given as a hypnotic, Dormison does not have the vile taste or persistent smell of paraldehyde.

The following practical conclusions may be made:

1. If a patient does not respond to a particular dose of Dormison, it is unlikely that he will respond to an equivalent dose of Sodium Amytal.

2. Dormison produces less hangover than doses of Sodium Amytal with equivalent hypnotic effect; it has no more hangover effect than paraldehyde.

3. Dormison is to be preferred to paraldehyde because of its combination of a similar degree of safety and efficiency with the absence of unpleasant taste or smell.

4. In the occasional case where a maximal dose of Dormison (2.5 gm.) is ineffective, Sodium Amytal will probably be ineffective also, but paraldehyde may give a satisfactory result.

DORMISON AS A SEDATIVE

In our experience, Dormison is of no value as a sedative in patients with delirium tremens, alcoholism with severe tremors, and drug addiction with severe withdrawal symptoms, or other severely disturbed patients, because it has to be given in toxic or near toxic doses to produce a satisfactory sedative effect. Cumulative toxic effects—drowsiness, ataxia, and slurred speech—were seen in 5 patients who had taken average daily dosages of 3.89, 5.5, 5.94, 8.0, and 10.16 grams for 6, 4, 4, 2, and 4 days respectively. The toxic symptoms cleared completely within 48 hours after discontinuing the drug: in 2 cases where symptoms were detected at an early stage discontinuing the daily sedative dose but continuing the regular nightly hypnotic dose was sufficient to clear up the symptoms in 24 hours. Although Dormison is of no use as a sedative in these severe cases, it can be used successfully as a nontoxic hypnotic; large doses, of the order of 1.75 gm. or more, are required.

Dormison was used with fair to good success as a sedative in cases of alcoholism with

mild or moderate tremors, in doses of .75 to 1.0 gm. 3 times a day, with a larger hypnotic dose at night. Our experience would suggest that the total dose in 24 hours should be held below 5-6 gm. and that there is a danger of toxic effects developing if a dosage level of 5-6 gm. per day is continued for more than 2 or 3 days. A definite aldehyde-like odor, but faint in comparison with that of paraldehyde, was noted in all patients who were given Dormison as a sedative in regular doses for more than 2 days. This suggests that an aldehyde is an intermediate step in the metabolism of Dormison.

In general, we are not enthusiastic about the use of Dormison as a sedative.

CUMULATIVE TOXIC EFFECTS

One seriously ill 67-year-old patient was drowsy the morning after the administration of two 2.0 gm. doses of Dormison: an equivalent dose of paraldehyde had exactly the same effect. Otherwise, no tendency to cumulative effect was noted in any patients receiving Dormison as a hypnotic only, whatever dose was given. One patient was given 90.875 gm. in 67 trials over 90 days, a second received 71.665 gm. in 54 trials over 97 days, and a third 56.75 gm. in 48 trials in 48 days.

When used as a sedative in large doses, drowsiness, ataxia, and slurred speech are liable to develop (see above): this has the additional clinical significance that patients who take Dormison as a sedative without proper medical supervision may develop a toxic psychosis. We have not actually seen a delirium due to Dormison, but we have observed a mild confusional state, as reported below.

Case History of Mrs. X: toxic confusional state due to Dormison. This 35-year-old woman had been addicted to various barbiturates for 4 years, and 3 months before admission she had been in another hospital for treatment of addiction to Sodium Amytal. At the time of her discharge from this hospital she was taking Dormison as a hypnotic, but she began to use it in progressively larger amounts as a sedative and eventually became irritable, anxious, unable to eat or sleep and was admitted to hospital. The exact amount of Dormison that she had taken could not be ascertained: her statement that she had taken 40 capsules (10 gm.) over the preceding 5 days was undoubtedly a gross understatement—she admitted that she had taken 1.5-2.0 gm. in a

single dose just before her admission. On admission, she thought she was in another hospital, but was otherwise well oriented: she was slightly confused, irritable, abusive, lethargic, and complaining; there was some difficulty in passing urine. There were no delusions or hallucinations. The next day, she was quiet but shaky and on the third day she had apparently recovered. There were no psychological withdrawal symptoms and the anxiety and tremor should probably be interpreted as toxic rather than withdrawal symptoms.

DORMISON AND ANTABUSE

No adverse reaction was noted in patients taking both Antabuse and capsules of Dormison, which contain no alcohol. Elixir Dormison contains 2% alcohol, so that the possibility of an "antabuse reaction" might be considered negligible. Five patients received elixir Dormison in doses of from .75-2.0 gm. when taking Antabuse, and one of them developed a mild "antabuse" reaction.

This patient was given 1.0 gm. of Dormison containing 0.32 c.cm. alcohol, immediately after the initial dose of 2.0 gm. of Antabuse. A mild reaction of headache and dizziness developed 20 minutes later and lasted 30 minutes or so. It would seem that a reaction would not have developed in this case if the 2 drugs had not been given at the same time, as later on, when this patient was receiving 0.5 gm. Antabuse a day, he had no reaction to half an ounce of whiskey: a few days later when receiving 1.0 gm. Antabuse a day, he had a moderate reaction to one ounce of whiskey.

A much more severe reaction was seen in a 39-year-old outpatient alcoholic who was taking 0.5 gm. Antabuse daily. One day he took one or two large jiggers of elixir Dormison that had been prescribed for his wife by a private practitioner (2.5-5.0 gm. Dormison, with .8-1.16 c.cm. of alcohol). Within 5 or 10 minutes, he developed flushing of the face and headache, then pallor and nausea. He was brought to the hospital where examination, 45 minutes after taking the elixir, showed a mixture of hypnotic effect and "Antabuse reaction"—he was confused and disoriented, pale and hypotensive. After treatment with oxygen and intravenous ascorbic acid, he recovered well and was able to go home 2 hours after taking the elixir.

It seems reasonable to conclude that elixir Dormison should not be given to patients receiving Antabuse, although the capsules may be given.

ADDICTION AND HABITUATION

Addiction to Dormison did not occur when the drug was used as a hypnotic only; no physiological or psychological withdrawal

symptoms were seen when the use of Dormison was discontinued, nor was there any evidence of the development of tolerance to increasing doses. None of the 5 cases of drug addiction to whom Dormison was given as a hypnotic showed any tendency to become addicted, but one neurotic with severe insomnia who had previously been addicted to various barbiturates began to develop the habit of asking the night nurse to wake him up for a second dose so that he could "be sure to sleep through the entire night"; the drug was accordingly discontinued. He had never asked for Dormison during the day, there was no tolerance to increasing doses, and there were no withdrawal symptoms, psychological or otherwise.

On the other hand, when Dormison is used as a sedative, habituation and some degree of tolerance may develop, although certainly no more than is seen with paraldehyde or barbiturates. When used as a sedative, in a patient with alcoholism or drug addiction, there was no more of a tendency to psychological dependence than is found with paraldehyde or barbiturates; in fact, 2 alcoholics and 1 drug addict complained that Dormison did not have the "kick" and the "lift" of paraldehyde but just made them sleepy. In short-term use, tolerance to increasing doses did not develop. In the case of Mrs. X., described above (see "Cumulative Toxic Effects"), there was definite habituation, psychological dependence, and possibly some tolerance to increased doses, but no withdrawal symptoms. This patient had previously been addicted to barbiturates.

One may draw the practical conclusion that if Dormison is used as a hypnotic only, addiction will not occur; if it is used as a sedative, there is a definite possibility that patients may develop addiction although this may be less likely than with other sedative-hypnotic drugs because Dormison is ultra-short-acting and tends to lack their stupeficient and euphorogenic action. We believe that Dormison should not be given as a sedative or prescribed as a hypnotic on an outpatient basis (unless strict supervision is possible) to any patient who has previously been addicted to barbiturates or to any other drug; however, it may be used as a hypnotic in

these patients under hospital conditions without fear of addiction.

SUMMARY AND CONCLUSIONS

Dormison is a drug of a new type that, when used as a hypnotic, is highly efficient and relatively nontoxic and noncumulative. It is the hypnotic of choice in elderly, senile, and arteriosclerotic patients and it has definite advantages over other hypnotics in other types of patients.

The hypnotic effect is highly specific, and Dormison is of little value as a sedative since toxic or near-toxic doses are required to produce an adequate sedative effect in disturbed patients. We have observed cumulative effects only when large doses were given as a sedative.

The danger of addiction may be less than with other hypnotic-sedative drugs, as Dormison is ultra-short-acting and tends to lack their stupefying and euphorogenic action. Nevertheless, Dormison should not be given as a sedative to patients who have previously

been addicted to other drugs, and it should be used as a hypnotic in these cases only under hospital conditions. In view of previous reports, and our findings on cumulation and addiction, barbiturates should not be given to patients receiving Dormison until such time as extensive data are available on the potentiating effect of Dormison on barbiturates in man.

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THE DIAGNOSTIC USE OF AMOBARBITAL SODIUM ("AMYTAL SODIUM") IN BRAIN DISEASE¹

EDWIN A. WEINSTEIN, M.D., ROBERT L. KAHN, M.A.,
LEROY A. SUGARMAN, M.D., AND LOUIS LINN, M.D.
NEW YORK, N. Y.

Amobarbital sodium (amytal sodium^R) is a drug with widespread clinical applications. Besides its value as a hypnotic and sedative, it has produced transitory improvement in psychotic patients (1-3), has been used in narcoanalysis (4) and to elicit anamnestic data that could not be obtained in ordinary clinical interviews. In recent years it has been given to schizophrenic patients to provide data of diagnostic and prognostic significance (5, 6). Amytal sodium has also been useful in the study of behavior in diseases of the nervous system. In patients who showed denial of illness (7) and disorientation for time and place (8), it was noted that, after these phenomena had cleared clinically, they could be reproduced by the intravenous administration of amytal sodium.

The purpose of the present investigation was to determine (1) whether amytal sodium can produce patterns of disorientation and denial of illness in patients with brain disease who had not previously shown such behavior clinically, (2) whether amytal sodium given under the same conditions can elicit these phenomena in normal individuals without brain disease, and (3) whether the procedure can be used as a diagnostic test to differentiate between patients with and without brain disease.

MATERIALS AND METHODS

A total of 138 patients was studied. Of these, 88 had clinical, roentgenological, or anatomical evidence of brain disease. The cases were selected on the basis of consecutive admissions to the neurological ward of the hospital. Patients who clinically manifested some disorientation or denial of illness were

excluded. Fifty patients used as controls had peripheral nerve or radicular lesions, or were diagnosed as psychoneurosis after psychiatric study and negative medical and neurological workup.

Among the 88 patients with brain disease the following diagnoses were made:

Diagnosis	No. of cases
Brain tumor.....	28
Degenerative and demyelinating diseases....	22
Cerebro-vascular disease.....	14
Toxic-inflammatory states.....	7
Convulsive states.....	8
Post prefrontal lobotomy.....	3
Post ECT.....	2
Nonspecific brain disease.....	4
Total	88

To understand more fully the rationale of the procedure used in this investigation it is necessary to review briefly the patterns of disorientation and denial of illness described in organic brain disease.

While gross disorientation for place and time occurring in patients with brain disease or injury or in toxic states is readily recognized as evidence of altered brain function, the various patterns of partial disorientation are less well distinguished. These have been studied by Paterson and Zangwill (9) and Weinstein and Kahn (8, 10). The patient may misname the hospital, giving the name of another hospital or a nonexistent place. He may use a euphemism such as "rest home" or "repair shop." He may give the correct name of the hospital but state that he is in a restaurant or hotel. He may name the hospital correctly but locate it in another city or another part of the same city. He may state that he has been in another hospital of the same name, having the same personnel but situated elsewhere, a phenomenon first described by Pick (11) as "reduplicative paramnesia." Another type of partial disorientation for place consists of the patient naming and locat-

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From the Neurological and Psychiatric Services of The Mount Sinai Hospital, New York.

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ing the hospital correctly but greatly condensing the distance between his home and the hospital. Thus a patient who lives several miles away may say his home is in the next street. Another pattern is the confabulated journey in which the patient confabulates having gone on a shopping trip or a visit to his home.

Disorientation for time is expressed by errors in the year, month, and time of day. Under hospital conditions patients without brain disease made errors in the time of day but these did not cross a meal time. Only in patients with organic involvement were morning and afternoon, afternoon and evening, or day and night reversed. It was important to ask what part of the day it was as some patients give approximately the correct time but reverse a.m. and p.m. Patients with brain disease also made errors in the year and month that were not present in normal control groups.

Denial of illness or verbal anosognosia is not uncommon among patients with brain disease (7, 12). Thus a seriously incapacitated person may state that he is perfectly well and deny such disabilities as hemiplegia, blindness, diplopia, headache, vomiting, loss of memory, and the fact that an operation has been performed. A patient may deny a major incapacity such as a hemiplegia and say that his main trouble is constipation. Some patients express denial by confabulating situations that are obviously incompatible with the existence of illness.

TEST PROCEDURE

Immediately before and during the administration of amytal sodium each patient was examined systematically for orientation and awareness of illness using a standard series of questions. These questions were selected to elicit the several patterns of disorientation and denial described above and are as follows:

What is today's date? What month is it? What year is this? What time is it now? What part of the day? Where are you now? What is the full name of this place? What kind of a place is this? Where is this place located? How far from here do you live? Have you been out of the hospital at any time since you came here? Where were you last night? Have you been in any other hospital of this name? Who am I? Have you seen me before? Is

there anything the matter with you? Are you sick? Why did you come here? What is your main trouble? Do you have—(mentioning specific symptoms or disabilities)?

The amytal sodium was given intravenously, in a solution of 0.5 gm. in 10 cc. of distilled water at a rate of 0.05 gm. per minute. As the drug was administered the patient was asked to count backwards from 100 to 1. The injection was continued until the patient showed rapid nystagmus on lateral gaze in both directions, slurred speech, errors in counting backwards, and drowsiness. These were regarded as physiological indicators of the effect of amytal. The total amount of amytal given to a patient depended on the appearance of a maximal effect of the drug. The quantity actually given ranged from 0.1 gm. to 0.5 gm., with the exception of 3 cases in which no amytal effect was evident until 0.8 gm. was given.

As soon as the physiologic effects of the drug were manifested, the patient was again interviewed with the identical questions used in the pre-amytal examinations. When a patient made an error the question was repeated immediately as well as several times later to determine the persistence of the error. In any case, all the questions were repeated at least twice during the amytal interview. For an error to be considered significant it was necessary not only that it be persistent but that it be a change from the answer to the identical question asked prior to the injection of the drug. This made it possible to observe the changes in behavior that occurred as a result of the action of the drug. Thus, if the patient does not know the exact address or distance from his home prior to receiving amytal, such errors when reiterated during the injection are not regarded as significant. Some patients minimize their symptoms prior to amytal but only a change from this minimization to an actual delusion of not being ill was considered significant. If a patient who had complained of headache prior to the administration of the drug states, under amytal, that he feels well, the response is considered to indicate denial of illness only if he also states that he has not had headaches earlier or did not come to the hospital because of them. Once in a while patients answer questions with, "I don't know." Such an answer

is not considered to necessarily indicate disorientation or verbal denial of illness.

RESULTS

CHANGES IN BEHAVIOR FOUND ONLY IN PATIENTS WITH BRAIN DISEASE

A—Disorientation for Place.—The following patterns of disorientation were elicited under amytal sodium only in patients with demonstrable brain disease and in none of the control group.

(1) Unrelated place: the patient stated he was home or in a store or night club or some other place completely unrelated to a hospital.

(2) Misnaming: the patient stated that he was in a hospital but named it incorrectly, either calling it by the name of another hospital, usually one that he had been in previously or that was near his home, or else using an apparently nonexistent name.

(3) Variant of hospital: the patient stated that he was in a "rest home" or "sanitarium" or "convalescent place."

(4) Displacement: although the hospital might have been named correctly, the patient located it in another city, or else the distance between the hospital and the patient's home was grossly in error.

(5) Reduplication: the patient confabulated that he had been in another hospital with the same name as this one, with the same personnel and many of the same physical attributes.

(6) Confabulated journey; the patient confabulated going home or otherwise taking a trip during the period of his hospitalization.

Table 1 indicates the incidence of these patterns of disorientation for place. A total of 47 patients with brain disease manifested at least one of the patterns of disorientation for place not found in any of the control patients.

B—Disorientation for Time.—Two patterns of disorientation for time were shown only by patients with brain disease and by none of the control group. The specific incidence is indicated in Table 2. A total of 19 of the brain disease group showed at least one of these manifestations.

C—Disorientation for Person.—Misidentification of the examiner was shown by 24 of the patients with brain disease but none of the controls. The misidentification consisted of describing the examiner as in some other

occupation, such as a "lawyer" or "an entertainer," by calling him by some other name than that given prior to the administration of the amytal, or by the patient's stating he had known the examiner previously before coming to the hospital.

D—Denial of Illness.—Three patterns of denial of illness were shown by the brain-diseased patients but were not found in any of the controls:

(1) Complete denial: the patient denied that he was sick in any way even when questioned specifically about his symptoms.

TABLE 1

DISORIENTATION FOR PLACE SHOWN ONLY BY PATIENTS WITH BRAIN DISEASE

Type of disorientation	Controls (50)	Brain disease (88)
Unrelated place.....	0	22
Misnaming	0	19
Variant of hospital.....	0	9
Displacement	0	28
Reduplication	0	6
Confabulated journey.....	0	25

TABLE 2

DISORIENTATION FOR TIME SHOWN ONLY BY PATIENTS WITH BRAIN DISEASE

Type of disorientation	Controls (50)	Brain disease (88)
Disorientation for year.....	0	15
Inversion of day and night.....	0	7

TABLE 3

PATTERNS OF DENIAL OF ILLNESS SHOWN ONLY BY PATIENTS WITH BRAIN DISEASE

Type of denial	Controls (50)	Brain disease (88)
Complete denial.....	0	20
Denial of major, aware of minor, aspects of illness.....	0	16
Confabulation	0	10

(2) Denial of major, but aware of minor, aspects of illness: the patient denied, for example, that she was hemiplegic but complained of poor appetite.

(3) Confabulation: the patient denied his actual symptoms, but confabulated the presence of another illness to account for his hospitalization. Thus, a patient said he came to the hospital to have a baby, or a patient, while denying a craniotomy, confabulated that he had an appendectomy.

The incidence of these patterns of denial of illness is indicated in Table 3. A total of

46 of the patients with brain lesions showed at least one pattern of denial of illness not found in any of the controls.

CHANGES IN CONTROL PATIENTS WITHOUT BRAIN DISEASE

In 7 of the 50 control patients a type of disorientation for place was shown in which the address given was inaccurate but related to the correct address. While The Mount Sinai Hospital is actually located at 100th St. and 5th or Madison Avenues, this type of disorientation was characterized by giving correctly only part of this address, such as "100th St. and Park Ave.," or "5th Ave. and 105th St." This type of behavior was also shown by 16 of the patients with brain disease. There were 3 other changes in behavior that were each found in only a single control

TABLE 4

CHANGES IN PATIENTS WITHOUT BRAIN DISEASE

Type of change	Controls (50)	Brain disease (88)
Disorientation, related address.....	7	16
Disorientation for month.....	1	11
Disorientation for time of day across a meal time.....	1	18
Denial of illness on general, aware of symptoms on specific, questioning..	1	11

patient. These were disorientation for month and disorientation for time of day across a meal time. One patient said that there was nothing wrong with him in answer to a general question but admitted his symptoms when specifically asked about them.

In Table 4 the incidence of these errors in patients without brain disease is shown and is compared with patients with brain disease.

DIFFERENTIATING VALUE OF THE CHANGES IN BEHAVIOR UNDER AMYTAL SODIUM

Summarizing the results to date, 12 patterns of disorientation for place, time, and person and denial of illness were elicited under amytal sodium in patients with brain disease that were not found in any of the controls. According to these criteria, 57 of 88 or 65% of patients with brain disease could be differentiated. The incidence was highest among patients with brain tumors. Twenty-three patients showed more than one pattern

of disorientation and/or denial during the administration of the drug. There were 10 positive results among 14 cases with cerebral vascular disease. Of 22 patients with clinical diagnoses of demyelinating and degenerative disease, 13 showed disorientation and/or denial. Only one positive result was obtained in 8 patients with convulsive states. The procedure was positive in all 3 cases following prefrontal lobotomy for intractable pain and in 2 patients receiving electric shock therapy.

CASE REPORT

The following case of a patient with a tumor of the third ventricle is presented as an illustration of the value of the procedure in establishing a diagnosis of organic brain involvement.

A 49-year-old salesman was admitted to the hospital on October 13, 1950, with a complaint of failing eyesight of 3-4 months' duration and headaches for the same period. For the past year he had noted a diminution of libido. He had had eye trouble since the age of 6 including 2 operations for glaucoma. There was a history of consumption of 1 to 2 quarts of whiskey per week.

Routine neurological examination, x-ray of the skull, and lumbar puncture showed no abnormalities. There was a corneal opacity in O.D. and vision was reduced to fingers at 2 feet, while in O.S. it was $\frac{20}{200}$. EEG record was normal. The patient had a jovial, restless manner with a tendency to boast of sexual activities and the amount of money he had made. His family stated that he had always been that way. He was completely oriented and prior to the administration of amytal sodium admitted headache, poor vision, and loss of libido.

On October 28, 0.2 gram of amytal sodium was administered intravenously and the following protocol recorded in part.

Time elapsed from start of injection	Amount
1'00".....	0.05 gm.
(Patient counting backward.)	
2'50".....	0.15 gm.
(Errors in counting backward.)	
4'10".....	0.2 gm.
(Nystagmus appeared.)	

Q. What do you call this place? A. I have no idea.
How long have you been here? 2 or 3 days.
What sort of a place is it? No.
Does it have a name? (No answer.)
Why are you here? To sell furniture.
Any other reason? No.
Name of this place? No idea.
Anything the matter with you? No.
Sick? No.
Perfectly well? Yes, sir.

Been in a hospital recently? (No answer.)
Time now? 7:20. (Actually 4:00 P.M.)
Morning or evening? Evening.
Had supper? No.
Today's date? Thursday, September 20, 1920.
How old are you? 21.
When were you born? January 16, 1901. (Correct.)
Anything the matter with your eyes? Definitely.
What? Poor sight.
What is it due to? Drinking.
Any headaches? No.
Any sexual difficulty? No.
When did you have intercourse last? 2-3 months ago. (Probably a confabulation.)
Where? Chicago.
Where is this place? Have no idea—all the way up in the heart of the district.
How far from your home is this place? 3 miles. (Distance of patient's business address from his home.)
12'15" (Needle removed.)
What do I do here? You're a doctor.
What do you call this place? An average lay-in hospital.
What's it for? For people who have to have things done for them and so on and so forth.
Why are you here? I'm going to have a baby.
How can you have a baby? Doing the reverse English.
Where does the baby come from? Right here. (Indicates abdomen.)
I think you are kidding. Well, I can't help that—do you really?
Where is this place? Just below where I live—in the William Penn Hotel.
What street? I don't know—give me a cigarette.
What time is it now? 7:00 (Actually 4:10.)
Have you had headaches? No.
What is the name of this hospital? Pittsburgh General.
What city? Pittsburgh.
Pittsburgh? I hope so.
Why are you in the hospital? To give birth.
Isn't that unusual? Not my way. (Patient is restless.)
What time is it now? 8:00.
Isn't it light for 8:00? Well, we are west of the Alleghenies. I've seen you before.
Where? On the furniture market.
But I'm a doctor. There are lots of doctors on the furniture market.
Why did you come to the hospital? To prove I'm innocent.
Of what? Of attacking a girl.
Do you know where you are now? Pittsburgh.
Time now? 7:30.

At 5 p.m., nystagmus was no longer present. The patient named the hospital correctly, located it within 10 blocks of its actual site, gave the correct date and time and admitted all aspects of his illness without confabulation.

A pneumoencephalogram was performed. There was marked dilatation of both lateral ventricles. The third ventricle was also dilated and shifted to the right side. On lateral view there was a large

filling defect in the third ventricle antero-superiorly with a slight degree of posterior displacement of the iter. The body of the right lateral ventricle was elevated. This was suggestive of a large third ventricle tumor.

On 11-5-50 the patient received 9.0 cc of normal saline intravenously and the routine "amyltal" procedure was carried out. There was no change in orientation, no denial of illness, no misidentification or confabulation.

On November 6, radiotherapy was begun and the patient developed a marked disturbance in behavior comparable to that manifested in the amyltal sodium interview. He became disoriented for time of day, confabulated trips from the hospital, stated he was in Mount Sinai Hospital in Miami, Florida, and on other occasions stated that he was in the St. Moritz Hotel. He became incontinent of urine and confabulated having had sexual relations. An EEG record taken on 11-17-50 showed bilateral slow wave abnormalities at a rate of 4-6 per second, slowest over the frontal regions. A similar record was obtained on 1-16-51. After one month of treatment improvement was noted both in his behavior and visual acuity and he was discharged on January 16, 1951. During the following year he showed no overt disturbances in behavior. An EEG taken on February 28, 1952, was normal. He was then given 0.45 gm. of amyltal sodium intravenously. Under the influence of the drug he became markedly disoriented for place ("Carlton Terrace") and denied ever having had headaches and sexual difficulties.

Comment: In this patient the routine clinical examination and the EEG record did not distinguish between a hypomanic state and structural disease of the nervous system.² The positive amyltal interview indicated the presence of an organic lesion and also served as a preview of the type of behavior that resulted when the patient's condition became exacerbated under radiotherapy. The positive amyltal interview one year later indicated that despite clinical improvement the pathological process was still present.

DISCUSSION

The results indicate that the procedure as described is of clinical value in differentiating patients with certain types of brain disease from those whose symptoms are due to other causes. In the cases studied, the greatest

² A study of the findings of this procedure among patients with affective psychoses is in progress and will be reported shortly. As in the case described in detail, a hypomanic state may occur in organic disease as well as in an affective psychosis. The results to date indicate that psychotics do not show the same patterns of behavior as patients with brain disease.

number of positive results occurred with rapidly developing deeply seated or diffuse lesions. The lowest incidence was found with very slowly progressive or stationary processes and with lesions on the surface of the brain that did not invade the substance. The test proved especially useful in the early diagnosis of tumors in the region of the third ventricle. In these patients, the first symptoms are apt to be those of anxiety, irritability, and headache, which are often impossible to distinguish clinically from psychoneuroses. Among the cases listed were 3 patients with suspected malignancies where a positive amytal test suggested intracranial metastases that were later verified. Patients who were depressed and complained of loss of memory early in the course of vascular or degenerative disease also showed positive results when routine procedures were inconclusive. The low incidence of positive results among patients with convulsive states indicates that the test is not of value in differentiating epileptic from hysterical fits. While a negative result does not rule out the presence of brain disease, a positive procedure, according to the empirically derived criteria, is evidence of altered brain function, and an indication for further study.

A striking feature was the identity of the patterns of disorientation and denial elicited under the administration of amytal sodium and those that occur in the course of intracranial disease, uninfluenced by drugs. Often the results of the amytal procedure were a prognostic indicator of the changes in behavior that came subsequently. Also it has been observed that in chronic barbiturate intoxication patients deny such symptoms as ataxia and urinary incontinence(13). These facts suggest that the drug has an additive action in enhancing the effect of the structural lesion on brain metabolism.

The correlation of the behavioral changes produced by the drug with the etiologic type of lesion, the degree and rate of anatomical involvement, and other indices of levels of brain function such as the electroencephalogram are subjects for further study. The procedure should prove of value in studying the alterations of brain function occurring after prefrontal lobotomy and electric shock treatment. It can also be a useful tool in the

evaluation of alterations in brain function initiated by metabolic changes as in uremia and diabetes, and after the administration of ACTH and in intoxications caused by other drugs.

SUMMARY

The use of amobarbital sodium (amytal sodium^R) as a diagnostic test for brain disease is described. In 57 of 88 patients with proven brain disease, who on clinical examination showed no disturbances in behavior, the intravenous administration of the drug produced patterns of disorientation for time, place, and person and denial of illness. These changes were not obtained in any of 50 control patients. The applicability of the procedure to the study of alterations in brain function caused by structural, iatrogenic, metabolic, and toxic agents is discussed.

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REPORT ON THE USE OF SUCCINYL CHOLINE DICHLORIDE (A CURARE-LIKE DRUG) IN ELECTROCONVULSIVE THERAPY

B. F. MOSS, JR., M.D., C. H. THIGPEN, M.D., AND W. P. ROBISON, M.D.¹
AUGUSTA, GA.

Like many others we have found it desirable to administer curare, or other drugs producing a similar effect, to psychiatric patients receiving electroconvulsive therapy. The violent tonic and clonic muscular contractions regularly produced by the original ECT procedure, according to the method of Cerletti and Bini(1), in our experience as in the experience of others resulted in frequent and sometimes distressing complications. Despite all recommended measures, such as having attendants hold the patient, placing a pillow or sand bag under the dorsal spine, using straps to minimize the violence of muscular stress, etc., compression fractures of the vertebrae continued to occur as an unpleasantly frequent by-product of therapy.

When we used the brief-stimulus procedure devised by Liberson to give unidirectional induction, these fractures were not eliminated. More rarely but occasionally, fractures of the humerus, the acetabulum, and the neck of the femur also occurred(2). When the Reiter apparatus and technique were used the muscular response of our patients appeared far less violent, but fractures continued to occur(3). Experience with electronarcosis prompted us to modify this procedure and use the Electronicraft Electronarcosis apparatus to give a convulsive treatment followed by a mild nonconvulsive electric stimulation similar to that produced by the Reiter technique(4). This technique as worked out by Dr. Lester Bowles, a member of our department, led to a significant reduction of fractures but did not entirely eliminate them. Few complications of this sort were serious. Some of them, however, forced us to interrupt treatment with patients beginning to respond well and whose need to continue was indeed urgent.

Adequate premedication with curare prevented the occurrence of fractures(6). Beta erythroidin also served this purpose(7).

With both of these drugs, however, minor complications were frequent and occasionally even alarming manifestations occurred. Some of these have already been reported(8). Though the effects of curare are usually of short duration, we have, after many years of experience with it, continued to regard it as not without real possibility of danger to the patient. A recent experience is illustrative.

Following administration of curare in moderate dosage, electric shock treatment was given. Respiration was regained. Prostigmine 2 mg. i.v. was injected, as a precautionary measure, despite normal respiration and lack of appreciable cyanosis. The patient was returned to the floor, apparently in good condition. During her rounds to check the condition of patients awaking from electric therapy, the nurse, approximately 15 minutes after the treatment was given, found this patient in complete apnoea and spectacularly cyanotic. Artificial respiration was at once applied with 100% oxygen, and additional prostigmine (2 mg.) was given intravenously. The patient recovered after a period during which little tranquillity was felt by all concerned. It was plain that death would have occurred had the supervising nurse been delayed even a few minutes in her rounds.

Aside from these rare complications we have been impressed not infrequently by cyanosis and reactions suggesting at least the threat of laryngeal spasm in patients who have had curare prior to electric treatment. Though it has been possible to combat these complications, we feel, after many years of experience with curare, that genuine dangers arise occasionally when it is used. Though we share Bennett's opinion that curare is a valuable drug and that it enables one to avoid fractures, we cannot entirely share his optimism in advocating the confident use of this drug routinely(9). We are not alone in this attitude(10, 11).

Beside its value in preventing damage to the skeletal structures, any drug producing muscular paralysis would, one might think, reduce the considerable involuntary physical exertion to which the body is subjected during electric treatment. Many aged patients and some with severe coronary disease develop depressive psychosis that urgently de-

¹ Department of Neuropsychiatry, Medical College of Georgia, University Hospital, Augusta, Ga.

mands electric therapy. Despite the astonishing skepticism of some who, apparently on theoretical grounds, sweepingly condemn this treatment, it has plainly proved itself a regularly effective source of relief for patients with "involuntional melancholia," most of whom were, until its use, doomed to permanent psychosis and indescribable despair and suffering (12). Since electric treatment has so plainly shown itself a specific and adequate means to relieve this common illness, which was one of the most tragic disorders that man had to bear, it is surprising to note that blithe condemnation of it is still found in psychological and even in psychiatric writings (13-16). Some who deplore electric treatment glibly assume (through their application of psychodynamic theory) that such treatment is given to satisfy unconscious sadistic cruelty in the physicians who use it (17). No evidence is presented to support this gratuitous assumption. The same theories could, if one wished to philosophize, be applied most interestingly to the question why these commentators should be so bitterly opposed to a measure that relieves permanent disability and inexpressible anguish in so many patients.

Setting aside all questions about the effectiveness of electric therapy, it is plain that, for those who use it, any means of avoiding or minimizing risk for patients with coronary disease deserves every consideration. Though curare reduced the muscular activity of our patients, we found that delays in establishing adequate oxygenation often allowed mild cyanosis to develop despite our use of artificial respiration with 100% oxygen administered by positive pressure with the usual rubber bag employed in anaesthesia. After some years of experience and repeated consultations with cardiologists, we concluded that the administration of curare prior to electric shock perhaps added as much, or even more, burden to the cardiovascular system as it relieved through diminishing muscular activity.

At the suggestion of P. P. Volpitta and others in our department of anesthesiology, we began the use of succinyl choline dichloride, anectine, furnished by Burroughs Wellcome & Co., in doses of 0.3 mgm. to 0.5 mgm. per kgm. of body weight intravenously as a substitute for curare. This drug has shown

itself remarkably effective in approximately 300 electroconvulsive treatments of 41 patients with no untoward effect to date. With it we have achieved muscular relaxation far more complete than with the largest doses of curare. After medication it is indeed often difficult to discern any appreciable muscular contraction at all during electric therapy. Any observer can see that such minimal exertion as occurs could not possibly constitute a demand on even a severely damaged heart. With 100% oxygen artificial respiration is easily maintained throughout treatment and after. All patients remain healthily flushed, in striking contrast to many of those who have received curare. Because of these observations we have given electric treatment, with excellent results, to a number of patients who otherwise would, because of severe and recent coronary disease, have been considered very serious risks. In Table I are listed diagnoses and indications for the use of succinyl choline.

METHOD

Atropine sulfate grs. 1/150 is given by hypodermic one hour before ECT. Sodium pentothal grs. 7½ in 10 cc. of distilled water is prepared in a 10 cc. syringe. Succinyl choline dichloride 20 to 40 mgm. in 5 cc. of distilled water is prepared in another 10 cc. syringe. The dose of succinyl choline dichloride is often increased or decreased for subsequent treatments according to the patient's need. In our experience, approximately 20 mgm. has proved to be an optimum dose for most patients. (These solutions can be made up in advance of treatment by the nurse, one syringe of each solution for each patient to receive ECT.) The patient is first given the sodium pentothal slowly to light anesthesia in order to obliterate consciousness and obviate anxiety during the paralytic period prior to electric treatment. The pentothal syringe is then removed from the needle, which is left in the vein. The syringe containing succinyl choline dichloride is then connected to this needle and the drug injected rapidly. The succinyl choline dichloride can thus be given without a second venipuncture. During induction the patient is required to breathe 100% oxygen, and oxygenation is continued until normal spontaneous respiration is rees-

tablished. The effect of succinyl choline dichloride is almost immediate and full effect can be estimated by slight muscular twitchings within a few seconds after injection. This is followed by complete relaxation and respiratory paralysis. Electric treatment is then given. Respiratory paralysis is so complete that laryngeal spasm apparently cannot develop as it occasionally does in patients who have been given curare. In this totally relaxed state, thorough oxygenation can be maintained by artificial respiration. This is accomplished with standard anesthesia mask-bag

doses of curare can be obtained with a relatively small dose of succinyl choline.

We believe this method of producing temporary motor paralysis is, in experienced hands, a remarkably safe and useful procedure. It should, however, be emphasized that real dangers might arise from any breakdown in the apparatus by which positive-pressure respiration with 100% oxygen is maintained. Before beginning the use of succinyl choline physicians in our department received training in the department of anesthesiology.² We believe it is advisable for

TABLE 1

DIAGNOSES OF 41 CASES GIVEN ECT; WITH INDICATIONS FOR USE OF SUCCINYL CHOLINE

Indication for succinyl choline	Diagnosis	No. of cases	Collective No. of treatments
Osteomyelitis, both legs.....	Paranoid schizophrenia	2	16
Osteoporosis	Paranoid schizophrenia	1	7
Coronary disease, old myocardial infarction....	Paranoid schizophrenia	1	10
Laminectomy with spinal fusion.....	Paranoid schizophrenia	1	10
Laminectomy with spinal fusion.....	Paranoid state	1	14
Recent myocardial infarction.....	Paranoid psychosis, involutional.....	1	10
Poor risks, due to age and general condition....	Involutional melancholia	6	39
Humerus fractured by previous ECT.....	Involutional melancholia	1	9
Arteriosclerotic cardiovascular disease.....	Involutional melancholia	4	20
ASCVD with sinus tachycardia.....	Involutional melancholia	1	12
Previous compression fracture of dorsal spine from ECT	Depressive reactions	2	8
Very muscular males.....	Depressive reactions	6	47
Auricular fibrillation	Depressive reactions	3	25
Previous fracture of clavicle due to ECT.....	Depressive reaction	1	8
Poor risks due to herniated disc.....	Depressive reactions	3	26
Poor risk due to age and general condition....	Depressive reaction	1	8
Rheumatic heart disease with mitral stenosis....	Depressive reactions	2	18
Osteomyelitis of legs.....	Depressive reactions	3	24
Poor risk due to age and general condition....	Psychosis with cerebral arteriosclerosis....	1	4
Total		41	315

combination by positive pressure on the bag. This period of respiratory paralysis usually lasts about 3 minutes, rarely up to 5 minutes. In our experience no antidote has been necessary or even particularly desirable. Prostigmine enhances and prolongs the activity of this drug. It is therefore contraindicated. Procaine also is contraindicated for the same reason. Smaller doses of succinyl choline dichloride may be used when only partial relaxation without complete respiratory paralysis is necessary, thereby shortening the period necessary for artificial respiration. A degree of relaxation approximately equal to that afforded by the largest recommended

all who use this valuable drug to work first with someone who has had long experience in dealing with respiratory complications and meeting all emergencies that might arise.

In treating patients we do not routinely attempt to paralyze them completely. A dose of 20 mg. usually produces a degree of paralysis affording adequate protection against fractures. Complete paralysis is desirable in chronic osteomyelitis, recent fractures or similar bony weaknesses, and, as we have mentioned, in severe cardiac patients.

² We are grateful to Drs. P. P. Volpitto and David Davis for their kindness and cooperation in this work.

Our experience confirms the report of Holmberg and Thesleff (18) on succinyl choline iodide that succinyl choline offers a method of continuing treatment of patients with fractures, and a method to avoid fractures in susceptible cases. This method, as has been pointed out, is also valuable for patients with severe coronary disease and other cardiac disease for whom convulsive therapy was previously contraindicated because the violent muscular activity led to suboxygenation. Our experience convinces us that this drug enables one to treat cardiac patients without subjecting them to more stress than would occur in a person walking slowly across a room.

Holmberg and Thesleff reported that some of their patients treated with succinyl choline iodide had mild complaints of aching in the calf muscles and in the jaw (18). We have not noticed any of these minor reactions in our series. Otherwise, our observations with succinyl choline dichloride differ in no way from their report.

CONCLUSIONS

Succinyl choline dichloride i.v. is a useful drug to produce muscular relaxation in patients receiving ECT who would otherwise be poor risks because of susceptibility to fractures and pre-existing fractures. It has also proved of value in treating severely disabled cardiac patients for whom even slight exertion may be dangerous. This drug is potent and effective, but ultra-short-acting, seldom lasting more than 5 minutes. Artificial respiration is easily and adequately performed by standard routine methods. Oxygenation can be maintained at levels superior to that of bed rest. No untoward effects have yet been observed in over 300 electric treatments.

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THE TREATMENT OF TUBERCULOUS PATIENTS WITH ELECTROSHOCK THERAPY^{1, 2}

J. H. MCCLELLAN, M.D., AND ABRAHAM SCHWARTZ, M.D.

LOS ANGELES, CALIF.

For several years, we have employed electroshock therapy on the tuberculosis-neuropsychiatric service of this hospital in the treatment of patients suffering from tuberculosis who, in addition, have mental illnesses requiring treatment on a closed ward of a psychiatric hospital. This service was designated by the Veterans Administration in December 1949 for veterans of the West Coast area, a psychiatric consultant having been appointed to the tuberculosis service in order to achieve better integration between the psychiatric and tuberculosis treatment of patients.

From experience, we consider electroshock therapy a safe procedure for patients suffering from tuberculosis, even in advanced stages. There has been considerable controversy concerning its use in the treatment of patients with tuberculosis, even when the disease is in a latent stage. The essential facts of the controversy were outlined and discussed by Dr. Close⁽¹⁾.

Since 1949, we have treated 23 patients in various stages of tuberculosis (mostly far advanced), and the improvement in their psychiatric symptoms has been generally gratifying. There have been no deleterious effects insofar as the tuberculosis was concerned, even after administration, in some instances, of prolonged shock therapy; on the contrary, there has been universal improvement in the

pulmonary tuberculosis, with the exception of one patient. This man had had pulmonary tuberculosis for many years, with reactivation every 3 to 4 years over this period; and several months following the completion of electroshock therapy, he again had a slight spread of the tuberculosis. However, he maintained his improved mental condition sufficiently to be transferred to a hospital for the treatment of tuberculosis only, where his chest condition again progressed favorably. Judging from letters received from this patient, his mental condition remains satisfactory.

Table 1 shows an over-all picture of the treatment given, and representative cases are as follows:

RWC, 24, had had tuberculosis for several years, and was admitted here by transfer from a tuberculosis hospital where he had had a thoracoplasty. Four days postoperatively, he became confused, noisy, violent, used profane and obscene language, had visual and auditory hallucinations, and made many attempts to commit suicide. He remained in this condition after admission to this hospital; later, he refused to eat because he imagined his food was poisoned. He required tube-feeding for a short period. He had many peculiar delusions and would struggle violently, perspiring profusely, even when in restraint. He wanted to get to the window, and when taken there, he would yell: "There they are! There they are! They're after my wife and they are going to kill her!"; a short time later, he would be lying exhausted, saying, "They did it, they killed her; they brought her body in here and cut it up and put it on my tray." His delusions were extremely vivid and real to him, causing him to struggle so violently that he exhausted himself. In view of the fact that he had active tuberculosis and had just undergone operation, there was the likelihood of spread of the infection, as well as the possibility of doing harm to the operative wound. Every effort was made to control him before electroshock was considered. This was one of the first cases in this hospital in which ECT was used for a tuberculous patient. It was a subject of much debate by the medical staff, who were reluctant to use ECT, despite the fact that the patient's physical condition could not be treated because of his mental condition, and was actually becoming worse. On December 27 ECT was started, and after 5 or 6 treatments (given 3 times a week), patient showed great improvement. He was calmer and more cooperative; he began to

¹ This article was the winner of the Trudeau Award for 1952. This Award is presented annually by the California Trudeau Society, which is the medical section of the California Tuberculosis and Health Association. The parent organization, the Trudeau Society, was founded in 1916 at Saranac Lake, N.Y., and was named in honor of Dr. Edward L. Trudeau, who had established at that place the first sanitarium of its kind in the United States.—ED.

² From the Neuropsychiatric Hospital, VA Center, Los Angeles.

Reviewed by the Veterans Administration, and published with the approval of the Chief Medical Director. The statements and conclusions of the authors are the result of their own study, and do not necessarily reflect the opinion or policy of the Veterans Administration.

TABLE I

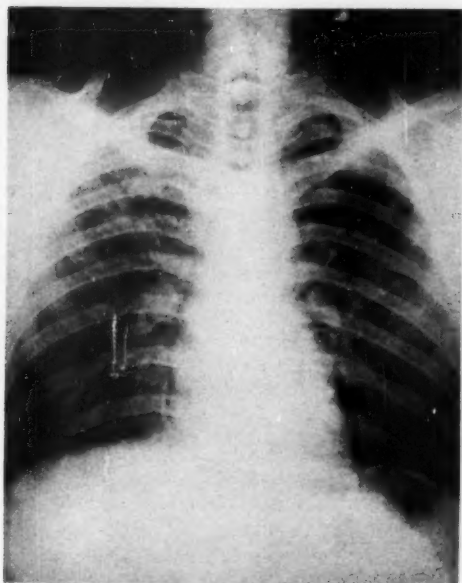
Patient	Psychiatric status prior to electroshock	Psychiatric status following ECT	Physical status prior to ECT	Physical status following ECT	Subsequent status
JW	Profoundly depressed and suicidal; had to be kept under close observation.	Cheerful and optimistic; able to cope with domestic difficulties.	Far-advanced tuberculosis for 5 years in all lobes of both lungs. Had had bilateral pneumothorax and been in hospitals most of the time with no improvement. All sputa tests positive.	Clearing of tubercular lesions as shown by X-ray; sputa negative on repeated tests. Regained appetite and weight.	Returned to his home as arrested case of tuberculosis.
	<i>Diagnosis:</i> Depressive reaction.	(20 treatments)	Streptomycin, 1 gram daily for 120 days, with PAS, prior to electroshock therapy.	See X-rays, Case No. 1.	
OA	Depressed, refused to eat, suicidal. Wept easily and spasmodically. Had delusions of persecution and reference, and delusory religious trends.	Periodic mild depression with intervening periods of cheerfulness; abnormal thought content on religious matters only. Eats and sleeps well.	Far-advanced pulmonary tuberculosis with cavitation; sputa positive for tubercle bacilli.	General condition much improved, and tuberculosis also improved with closure of cavity.	Now being considered for transfer to a hospital for treatment of tuberculosis only.
	<i>Diagnosis:</i> Schizophrenic reaction, catatonic type.	(52 treatments)	Streptomycin for 120 days, and bed rest.	See X-rays, Case No. 2.	
DM	Depressed and did not talk at first; then became hyperactive, noisy, and overtalkative.	All these symptoms in remission.	Has had moderately advanced pulmonary tuberculosis for many years. Sputum was positive.	Chest X-ray shows no significant change; sputa consistently negative for eight months. Patient atebrile and non-toxic.	Inactive tuberculosis; patient sent home on trial visit with his wife.
	<i>Diagnosis:</i> Involutional melancholia	(17 treatments)	Bed rest and one course of streptomycin.		
AH	Severely depressed and suicidal. He pleaded to be put to death and demanded medication for drug addiction. Grossly disoriented and markedly confused. Required restraint.	Cheerful and friendly, well oriented, with no overt suicidal trends. Drug addiction is in remission, although he occasionally asks for medication.	Pulmonary tuberculosis, active, moderately advanced. Involvement confined largely to upper half of right lung. Sputa positive.	Recent chest X-ray shows minimal discrete fibrotic lesion, right upper lobe. Sputa negative for one year. Now inactive.	Presently hospitalized
	<i>Diagnosis:</i> Schizophrenic reaction, paranoid type.	(18 treatments)	Bed rest, course of streptomycin.		

TABLE I—CONTINUED

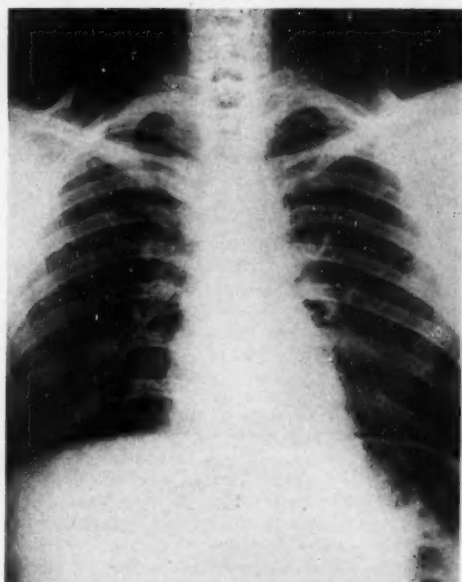
Patient	Psychiatric status prior to electroshock	Psychiatric status following ECT	Physical status prior to ECT	Physical status following ECT	Subsequent status
EH	Markedly depressed, had delusions of reference and persecution. Retarded and hyperactive. <i>Diagnosis:</i> Schizophrenic reaction, paranoid type.	No evidence of depression nor any of the other symptoms; cooperated well in treatment. (46 treatments)	Had tuberculous pneumonia involving right upper lobe, with cavitation. Bed rest; one course of streptomycin.	Chest X-ray showed considerable clearing of the lesion in the right upper lobe.	Transferred to hospital for treatment of tuberculosis only.
YS	Severe depression with delusions of reference and persecution; feelings of guilt and unworthiness.	All symptoms in remission, except for occasional depression.	History of pulmonary tuberculosis for over 20 years; radiograph of chest showed multiple discrete infiltrates in both upper lobes, which appeared to be largely fibrotic. Bed rest; one course of streptomycin.	No significant change in X-ray. Patient afebrile and nontoxic; all sputa negative for eight months.	Presently hospitalized.
KA	Severely catatonic and completely mute, with apathy and withdrawal occasionally followed by assaultiveness. Required spoon-feeding at times. Destructive of property, threw things out of the windows, etc.; had to be restrained. <i>Diagnosis:</i> Schizophrenic reaction, catatonic type.	Much more accessible, talks freely, oriented in all spheres. Writes letters to relatives, eats spontaneously, cooperates in treatment of tuberculosis and no longer requires restraint. (27 treatments) 16 ECT; 11 glissando	Tuberculosis for 4 years, far advanced, with cavitation in both lungs. Sputa positive. Patient unable to cooperate with bed rest.	Took bed rest better, and had a second course of streptomycin. Recent chest films do not show definite evidence of cavitation.	Presently hospitalized.
CB	Picture of severe melancholia. <i>Diagnosis:</i> Manic-depressive reaction, depressed type.	All symptoms in remission. (10 treatments)	Far-advanced, bilateral tuberculosis with cavitation; sputa positive. Bed rest; started streptomycin, which was discontinued because of severe erythema over body.	Tuberculosis unchanged at time of transfer.	Transferred to hospital for treatment of tuberculosis only.

TABLE I—CONTINUED

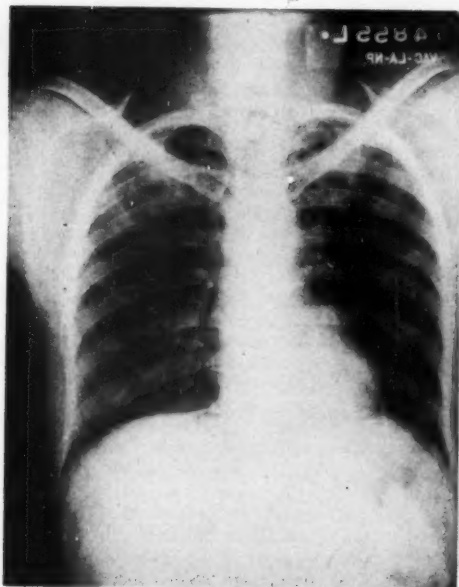
Patient	Psychiatric status prior to electroshock	Psychiatric status following ECT	Physical status prior to ECT	Physical status following ECT	Subsequent status
LO	Disoriented for time and place; hyperactive, agitated. Constantly seeking means of escape from the hospital.	All symptoms have cleared to the extent that he is definitely cooperative in treatment; he still has many paranoid delusions. (30 treatments)	Had pulmonary tuberculosis for about 6 years; admitted here with widely disseminated bilateral disease and all sputa tests positive. Strict bed rest and course of streptomycin.	Chest X-ray shows clearing with only bilateral linear opacities remaining. Sputum has been negative for 16 months. See X-rays, Case No. 3...	Presently hospitalized.
CR	<i>Diagnosis:</i> Schizophrenic reaction, hebephrenic type. Catatonic, mute, regressed, and assaultive.	All symptoms have been ameliorated to the extent that patient cooperates in treatment of tuberculosis, although he is still catatonic and delusional at times. (27 treatments)	Had had pulmonary tuberculosis for about 5 years; chest X-ray showed infiltration in both upper lobes.	Radiograph of chest shows fibrotic lesions of both upper lobes. All sputa tests negative for over one year.	Presently hospitalized.
JO	<i>Diagnosis:</i> Schizophrenic reaction, catatonic type. Extremely suicidal, hyperactive. Had to be kept in restraint most of the time. Had delusions of reference and persecution, and feelings of unworthiness.	All symptoms in remission. Completely cooperative in treatment of tuberculosis. (43 treatments)	Had pulmonary tuberculosis one year; moderately advanced lesion. Sputum positive. Bed rest, one course of streptomycin, and pneumoperitoneum.	General condition has improved. Chest X-ray shows some clearing, with closure of cavity. Sputum still positive.	Transferred to a hospital for treatment of tuberculosis only.



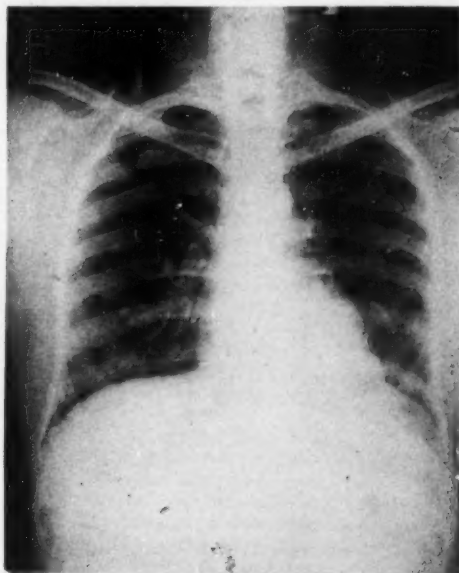
Case No. 1 (JW)—A: Roentgenogram October 11, 1949, shows infiltration throughout all lobes of both lungs.



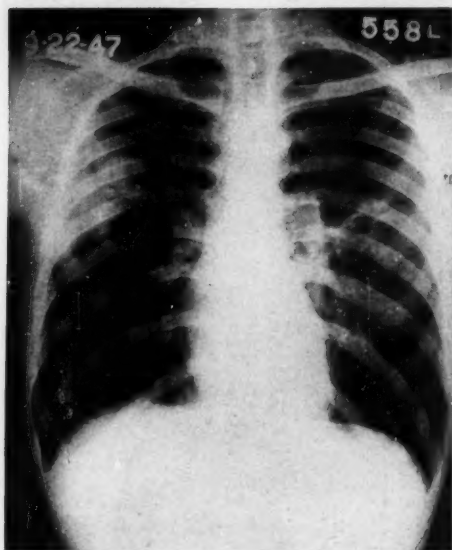
Case No. 1 (JW)—B: Roentgenogram July 19, 1950, shows considerable clearing of the bilateral tuberculous lesions.



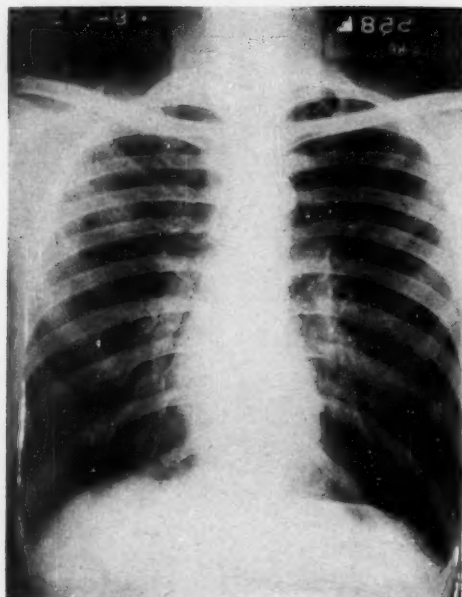
Case No. 2 (OA)—A: Roentgenogram May 2, 1950, shows far-advanced tuberculosis with cavitation in right upper lobe.



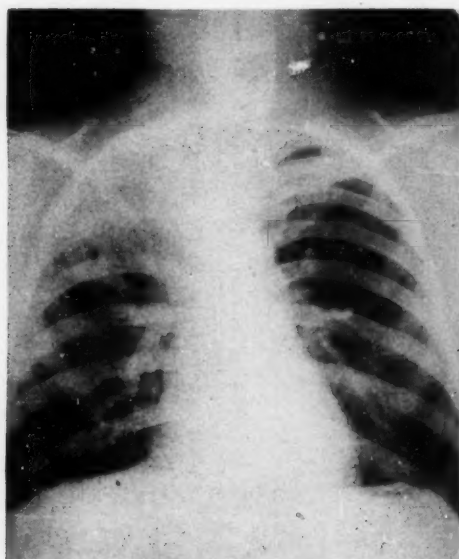
Case No. 2 (OA)—B: Roentgenogram October 8, 1951, shows considerable clearing of tuberculous lesions; no definite evidence of cavitation.



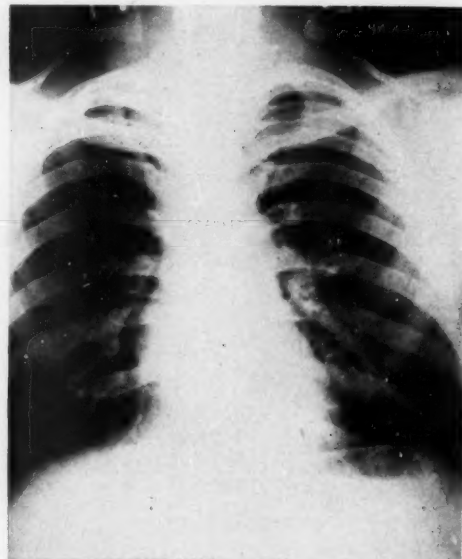
Case No. 3 (LO)—A: Roentgenogram September 22, 1947, shows widely disseminated bilateral disease.



Case No. 3 (LO)—B: Roentgenogram August 13, 1951, shows clearing with only bilateral linear opacities remaining.



Case No. 4 (SK)—A: Roentgenogram December 21, 1948, shows extensive tuberculous involvement in the right lung.



Case No. 4 (SK)—B: Roentgenogram July 19, 1950, shows marked clearing of the right lung, with only fibrosis remaining.

eat and to gain weight, and it was no longer necessary to keep him in restraint. No abnormal thought content was apparent for about a month, during which time the dosage was reduced to once a week. However, it soon became obvious that this dosage was not sufficient to maintain the mental improvement, and the dosage was increased to twice a week, then to 3 times a week until he again improved. It was then reduced to twice a week and then to once a week as he reached a stationary level so far as his mental status was concerned. He still had delusions, but they did not cause the severity of reaction that they had in the beginning. He was no longer a feeding problem, and was fairly cooperative in the treatment of his pulmonary condition. The tuberculosis became quiescent. His mental status was considered sufficiently improved, after 60 electroshock treatments, to warrant his transfer to a neuropsychiatric-tuberculosis hospital nearer his home.

Comment.—The treatment of this patient was in line with our plan to use the clinical response of the patient as criterion for the amount and frequency of treatment. The most overt clinical symptoms are used as criteria. The schedule must be sufficiently flexible to allow for change of plan as to amount of dosage and for discontinuance of treatment entirely if it does not seem necessary to give it any longer. The tuberculous status is also rechecked frequently.

ED, 56, when admitted on 6/3/49, was confused and disoriented. His mental condition became progressively worse. He was given to great violence. He was very noisy, and his language was abusive and obscene. He spat on personnel, kicked trays out of their hands, etc. On 10/27/50, the following note was made:

"The patient is almost continuously restless and hyperactive, creating a considerable problem in the treatment of his tuberculosis and in ward management in general, as he is a source of continuous disturbance to the other patients. He tends to assault others and is definitely suicidal, and has been so for some months. He will exclaim, 'Give me a gun so I can shoot myself,' and frequently begs other patients to kill him; he gives marked evidence of delusions of persecution. He is almost constantly belligerent and makes constant demands on ward personnel, but is never satisfied with the attempts made to satisfy his demands. It is almost impossible to keep him in bed unless restraints are used, and he requires constant strict supervision. All sedatives tried have only a transient effect. Because of his chronically disturbed mental condition, he is unable to cooperate in attempts to treat his tuberculosis. As constant attempts have been made over a period of months to alleviate the symptoms outlined above, without any significant change, it is recommended that ECT be instituted in the hope of improving his mental condition; otherwise he

is liable to become worse. The evaluation of the situation has been under consideration for some months, and it appears that the calculated risk of exposing him to electroconvulsive therapy is indicated if he is to be helped."

A diagnosis of schizophrenic reaction, paranoid type, chronic, severe, manifested by delusions of reference and persecution, with marked homicidal and suicidal tendencies, unimproved, was made. This patient had some pustular drainage from the upper third of the sternum; this had been previously diagnosed as possible osteomyelitis. After treatment with streptomycin, the drainage ceased. Electroshock therapy was started on November 15, 1950. Atropine sulphate (grains 1/100) and syncurine (1½ mgm I.V.) were given prior to shock treatment, syncurine being used as an added precaution because of its curare-like effect, in order to soften the convulsions. ECT was repeated on 11/16-17-20-22-24-27, and on 11/27 it was noted: "Patient is now quiet and does not require restraint. He is going to the ward dining-room for his meals; he is very polite, and states, 'I do not use profane language in the presence of women.'" He continued to make gradual progress until the completion of shock on 5/4/51 (49 treatments), and the improvement in his mental condition has been maintained. He is now occasionally disoriented as to his surroundings, for place and time, but is oriented for persons; he sometimes becomes irritated with ward procedures, but he is very neat and tidy, cooperates well in his treatment, and there are no clinical delusional trends. Because of the severity of this patient's mental condition, ECT was given at more frequent intervals than is usual, but in spite of the frequency and the lack of the usual rest period for recheck of patient's physical condition, the tuberculosis, far from being aggravated, has shown actual improvement.

IM, 24, was admitted to this hospital in restraints, as it was impossible to transport him otherwise because of his uncontrollable hyperactivity. He spat at everyone indiscriminately, and was noisy and highly belligerent. His language was abusive, profane, and obscene. He was disoriented in all spheres. From his behavior, there were indications that he was responding to auditory and visual hallucinations. His thought content was replete with religious delusional material, and he had delusions of persecution, exclaiming, "God, don't let them kill me; save my father." This acute psychotic episode had occurred shortly before his admission here, while he was on pass from a tuberculosis hospital in the vicinity. A diagnosis was made: schizophrenic reaction, acute, severe, paranoid type. It was considered imperative to ameliorate the psychotic symptoms; during this acute phase, it was impossible to examine him adequately physically. He had been transferred here with a diagnosis of pulmonary tuberculosis, reinfection type, minimal, left, apparently arrested, but activity could not be determined because of his mental condition. ECT was begun on the 13th day after his admission. Because of the severity of his mental symptoms, it was considered necessary that he have daily treat-

ments until the symptoms subsided. Three days later, he was in good contact with his environment, was oriented in all spheres and able to cooperate to some extent in his therapeutic management. Approximately 2 weeks after treatment was begun, and after his tuberculous status had been proved to be minimal and inactive, he was ready for transfer to another ward, where ECT was continued for a short time. He was then transferred to an open ward where he had the privileges of the hospital grounds and more association with other people. He adjusted well in this situation, and after a total of 15 treatments he was able to leave the hospital, having completely recovered from his psychotic episode, and with no reactivation of the tuberculosis by the use of electroshock therapy. When last heard from, he was pursuing studies in a school for social service workers.

SK, 33, was admitted from a state hospital; on admission, he was acutely depressed, suicidal, refused to eat, was violent at times, and required restraint because of his violent behavior and his suicidal threats. He had to be tube-fed for prolonged periods. He was profoundly depressed, but because of his having active tuberculosis with considerable pulmonary involvement the staff was extremely hesitant about using electroshock therapy. As he remained depressed, still refused to eat, and was unmanageable insofar as treatment of his pulmonary condition was concerned, ECT was decided upon, as there seemed to be no satisfactory alternative treatment. ECT was started on 12/6/49 and was given 3 times a week. The frequency was gradually reduced to a point where it was found possible to maintain the patient at the optimum level he had reached; this was found to be one treatment a month, and was continued until he was transferred to a neuropsychiatric hospital nearer his relatives. At the time of transfer, his tuberculosis had improved to the extent that he was considered an arrested case. There had been considerable clearing of the tuberculous lesions, as shown by X-ray, and his sputum had been negative for tubercle bacilli for over one year. He was afebrile and had no symptoms referable to his chest condition. He was kept on the maintenance dosage of ECT (one treatment a month), although the danger of reactivating the tuberculosis was recognized, because of the fact that his depressive trends would become worse without it, and he would begin to refuse food and become less cooperative in the general treatment program. The length of his stay here, and the delay in his transfer to another hospital, were due entirely to administrative difficulties. He was hospitalized here from December 16, 1948 to March 25, 1951, and received a total of 86 electroshock treatments (see X-rays, Case No. 4).

JA, 57, was uncooperative, euphoric, and confused when admitted by transfer from another hospital; he had auditory hallucinations and vague delusions of persecution. He was acutely disturbed emotionally, and completely disoriented. He was highly antagonistic, belligerent, and suspicious. In March 1951, a diagnosis of schizophrenic reaction, paranoid type, was made, and he was considered

for electroshock therapy. Between June 1950 and March 1951, he had been given considerable treatment for his pulmonary tuberculosis, which was extensive. At first, it was believed that because of patient's age, the duration of his mental illness, and the severity of his tuberculosis, ECT was contraindicated; however, because of the mental symptoms, which were preventing adequate treatment of the tuberculosis, it was decided to try it. The treatment achieved remarkable improvement in his mental condition in a very short time, and this improvement continued and has been maintained to date. There is some impairment in memory for recent events, but otherwise he is within normal limits mentally. He received bed rest, a course of streptomycin, and pneumoperitoneum for the chest condition, before and during electroshock therapy. The tuberculosis is inactive at the present time, and he is ready to be transferred from the tuberculosis service to another ward. He has had 37 electroshock treatments and is still receiving a treatment every 2 weeks, but it is planned to discontinue this soon. It is probable that he will be ready for discharge then.

JW, 36, was admitted by transfer from a private tuberculosis hospital because he had attempted suicide by slashing his wrists with a razor blade. On admission, he was very depressed and watched for every opportunity to harm himself. When the physician talked to him about treatment for his pulmonary tuberculosis, the patient stated that he had had it for more than 5 years, that most of this time had been spent in hospitals, but that the tuberculosis had gradually become worse. Chest X-rays showed far advanced pulmonary tuberculosis involving all lobes of both lungs, with cavitation, and all sputum tests were positive for tubercle bacilli. Patient had had bilateral pneumothorax. He continued to be severely depressed, with suicidal tendencies; this depression was attributed, in part, to domestic difficulties and, in part, to the fact that treatment had not improved his chest condition. He was placed on a strict bed rest regime, which he accepted. He had one course of streptomycin (1 gram daily, for a period of 120 days). Sputum test was negative on 10/29/49, and all sputa tests remained negative thereafter. There was a gradual clearing of the tubercular lesions, as shown by X-ray (see plates, Case No. 1), but in spite of this improvement in his chest condition, patient's depression and suicidal trends continued until ECT was started on December 9, 1949. After a series of 20 treatments, he resumed a normal outlook on life; no longer did he entertain suicidal ideas, and he was very cheerful, especially about the remarkable improvement in his tuberculosis. This improvement in the tuberculosis continued throughout shock therapy. Eventually, his domestic difficulties were cleared up and he returned to his home. He was discharged as an arrested case of tuberculosis.

Comment.—From our clinical experience with patients suffering from severe mental illness, aggravating and aggravated by advanced stages of pulmonary tuberculosis, we have no doubt about the value of electroshock

therapy, and its safety, in the treatment of such patients. Our results indicate that, when patients are so psychotic that they cannot cooperate in treatment for their tuberculosis, electroshock therapy may improve their mental status to the extent that they will accept treatment. We think some of these patients might have been successful in their suicidal attempts, or have died as a result of the tuberculosis, had it not been for the use of electroshock therapy. Moreover, there appears to be a uniformly specific improvement in the pulmonary tuberculosis following ECT, regardless of the stage of advancement when the treatment is started. This may be a secondary effect of electroshock therapy.

It is conjectured that electrotherapy, by hypothalamic stimulation, may alter cortical activity in such a way as to mobilize bodily defenses against various invading organisms(2).

Some sanitariums allow patients to have passes for home visits. Activities remain uncontrolled during the entire period they are away from the hospital. We believe this may be more detrimental to their illness than the alleged dangers of electroshock. Our service has been visited by psychiatrists and tuberculosis specialists, who wanted to evaluate our results. They have expressed surprise at the

favorable results obtained with the treatment we have outlined. Our psychiatrists have found it hard to overcome their reluctance to use electroshock therapy in the treatment of tuberculous-psychiatric patients, but they now believe that its value and safety have been demonstrated successfully. One of the authors, as chief of the tuberculosis service at this hospital, was extremely hesitant to use this treatment; he now decidedly advocates its use.

All the objections to the use of electroshock treatment for tuberculous patients that Dr. Close quotes in his article(1) were considered and discussed by the staff here prior to starting treatment. Some of our staff had similar objections, but they have not been substantiated by our observations, which have convinced us of the value of electroshock therapy in the treatment of tuberculous patients.

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THE HUMAN LIFE CYCLE AND ITS INTERRUPTIONS

A PSYCHOLOGIC HYPOTHESIS

STUDIES IN GERONTOLOGIC HUMAN RELATIONS I¹

MAURICE E. LINDEN, M.D.,² NORRISTOWN, PA.,

AND

DOUGLAS COURTNEY, Ed. D.,³ PHILADELPHIA, PA.

A review of the literature will lead the student of later maturity to discover 2 general tendencies, one of method, the other of attitude: (1) an effort to understand the whole of man through isolated criteria and (2) a tendency to regard adulthood as a more or less continuous state of maturity terminated by progressive decline and death.

An individual at any time in his life is the aggregate and interaction of many functions, some in development, some at peak, and some in decline. Any approach toward comprehending the nature of man that uses for measurement a single function, or even a group of functions, such as sensory acuity, motor response, intelligence, vocabulary, etc., succeeds in describing merely a dissected part of a totality. A society such as ours, which appears to place a heavy emphasis on the attributes of youthfulness, physical agility, and the behavioral constellation surrounding reproduction, makes the same error on a cultural scale that the researcher makes on a laboratory scale, *i.e.*, it fails to integrate enough human variables into a realistic life scheme, and views human growth with lopsided values, so that adult life is popularly regarded as the simple achievement of an ambiguous maturity followed by a general decline.

Shakespeare's cynical 7 ages of man (Table 1) parallel fairly closely the popular notion. The contributions of recent investigators,

notably summed up by such authors as Gumpert(1), Stieglitz(2), and Erikson(3), who find evidence for further personality growth in later adulthood, have not yet received sufficient attention.

This paper is an introductory effort to organize some observations and tentative conclusions made on the basis of psychiatric clinical experience with several hundred older patients of many diagnostic categories in and out of a mental hospital, and to develop methods and some criteria for testing the hypothesis that has evolved and is to be described.

BACKGROUND FOR A THEORY

A point of view regarding stages of maturation requires an analysis and resynthesis of the factors playing a part in personality organization. For simplicity these may be separated into 3 general groups: biologic, physiologic, and psychosocial. Focusing attention on one area yields unilateral conclusions.

Biologists have long considered the adult stage of all living organisms as the period of procreation and parenthood. Since the primary function of all living things will have been achieved by reproduction and subsequent life for the adult will be an *anticlimactic* outliving of usefulness, it follows that after rearing of the young the most logical sequential step must be termination of individual existence.

The physiologic investigators with an apparent biologic orientation seem to have been bent on finding means for sustaining juvenescence, keeping alive sexual-reproductive interest, and thus postponing individual terminus as they view it.

Little place is found in a mobile and aggressive society, except fortuitously, for individuals in the postreproductive phases of life. The popular and scientific concepts of

¹ Read at the fifth annual meeting of the Gerontological Society, Inc., September 6, 1952, Washington, D. C.

The authors wish to express their gratitude and indebtedness to Arthur P. Noyes, M.D., and Lawrence C. Kolb, M.D., Superintendent and former Assistant Superintendent, respectively, of Norrisstown State Hospital, for their help and valuable criticism in the preparation and development of the hypothesis.

² Norrisstown State Hospital.

³ Institute for Research in Human Relations.

climacterium and *involution* that relegate postclimacteric existence to an ignominious level in the pattern of civilization have been stultifying and restrictive. The absence of an adequate conceptual scheme, meager in-

The biologic dogma is applicable, probably, to most other forms of life in the animal kingdom, but seems singularly untrue in the human animal: An innate endowment for social organization in animals is very likely

TABLE 1
STAGES OF MATURATION *

Shakespeare ("As You Like It")	Erikson ("Childhood and Society")		Present Hypothesis	
"At first the infant mewling and puking in the nurse's arms."	Oral	Trust vs. mistrust	Instinctual supremacy	Evolution
	Sensory			
	Muscular	Autonomy vs. shame, doubt	Education of the instincts	
?	Anal			
	Locomotor	Initiative vs. guilt		Evolution
"And then the whining schoolboy, with his satchel and shining morning face, creeping like snail, unwillingly to school."	Genital			
	Latency	Industry vs. inferiority	Social learning	
?				
	Puberty and adolescence	Intimacy vs. role diffusion	Instinctual supremacy Pairing	Senescence
"And then the lover sighing like furnace, with a woeful ballad made to his mistress' eyebrow."				
	Young adulthood	Intimacy vs. isolation	Mating and reproduction	
?	Adulthood	Generativity vs. stagnation	Family creative Social creative	Senescence
"And then the justice in fair round belly with good capon lined, with eyes severe and beard of formal cut, full of wise saws and modern instances."	Maturity	Integrity vs. disgust, despair	Instinctual supremacy (involution)	
			State creative	
"The sixth age shifts into the lean and slipper'd pantaloons, with spectacle on nose and pouch on side. His youthful hose, well saved, a world too wide for his shrunk shank; and his big manly voice, turning again toward childish treble, pipes and whistles in his sound."			Moral and ethical reaffirmative Retrospective evaluative	Senility
"Last scene of all, that ends this strange eventful history, is second childishness and mere oblivion, sans teeth, sans eyes, sans taste, sans everything."			Social unlearning (Senile latency)	
			De-education of instincts	
			Instinct supremacy	

* Comparing and contrasting Shakespeare's poetic sardonicism with psychiatric and sociologic points of view. The popular bard's opinion, probably reflecting cultural attitudes, shows heavy E values and disdain for later maturity.

formation, and perhaps a lack of interest and attention have hampered a changing view.

The authors are of the conviction that the human life span is in fact a predetermined, inexorable cycle in which genetic and instinctual endowments are the motivators. The beginning and end points of this cycle are not birth and involution but conception and death.

the genetic conveyance of the results of eons of trial-and-error adaptation, but from generation to generation their societies are relatively immutable. While animals do appear to have societal organization and do appear to have cultures, it is in the transmission of these cultures that a difference is perceived between man and animal. Some ancient prompting deep in the genetic development of the animal

guides his activities, whereas the human culture is transmitted postnatally quite specifically to each individual and by elders as a rule. The human culture is so complex that the transmission process requires extensive recording systems with the attendant complexities necessary to maintain the communication network. On this basic difference between animal and human societies depends much of the relative difference in the function of the aging human being and the aging animal. The aging human individual is just beginning some of his most important functions when parenthood ceases.

STRUCTURE OF A HOLISTIC CONCEPTUAL FRAMEWORK

The approach of no single scientific discipline is sufficient to account for the behavior of the complete organism. Every step in behavioral progression is dependent on biologic diatheses, physiologic preparation, psychologic integration, and social demands. Man in action is the composite of these basic factors and his behavior is their expression. A study of observable behavior ought to disclose the functions of a total organization at any stage in progression.

It may well be that the additional function of the adult of preserving culture, of maintaining the annals of history, of keeping alive human judgment, of maintaining human skills, of preserving and skillfully contriving the instruments of civilization, and of conveying all this to oncoming generations, is the postreproductive work of the human organism and that this realistic and valuable quality of the human mind is uncovered or manifested in the senescent individual.

The authors are not unaware of the numerous arguments that are stimulated by a hypothesis of this type. It may be pointed out that the function of cultural maintenance is not unknown to the earlier stages of human development, and that procreativity does not preclude socially oriented thought and cultural precept. Obviously, these and related arguments must be accepted, but they do not refute the hypothesis. Personality development is a continuum. Factors present in fractional quantities in early periods of growth become preponderances in later stages, while the reverse is also true.

The initial observation giving rise to this theoretic formulation is that there appears to exist the same kind of conflict in the shift at middle life that exists during the adolescent shift. Traditionally, the youth at adolescence is rebellious. Under the pressures of pubertal change he seeks independence, self-expression, and freedom of action. The pronouncements of his elders, usually parents, are rejected out of hand as outworn solutions not applicable to himself.

We see a striking recurrence of this internecine strife at middle life. For convenience let us divide the life cycle into halves and let us name the young side of the middle of life as *evolence*,⁴ with the older side *senescence*. We may now speak of the "E's" and the "S's". We can perceive the rebellion of the E's against the S's. Some of this rebellion is the frustration that comes in recognizing the older wisdom, a recognition of the irreality of one's own wishes. Some of it comes from within. The individual perceives his own metamorphosis from an E to an S. He fights the change because our society has placed all its values in *evolence* and has not voiced or even recognized the more subtle inherent values in *senescence*.

The S counter-rebellion is a continuous re-statement of old ideals, a tenacious attachment to the established and proven solutions, a reluctance to countenance social revolution, and an increasing awareness of the value of the past as a predictor of the future and an instrument of judgment.

The S segment of life, rather than being a merely tolerated period before the organism's demise, is very likely a socially necessary phase following the mid-area in the human life cycle and continuing until the individual ceases to exist or until destructive processes supervene. It is probable that the psychophysiologic events that characterize involution are less significant as the termination of the reproductive function and are more important as preparation of the individual for subsequent social functioning.

Personality may be regarded as a series of peak achievements, and for every faculty that passes its prime a further developing

⁴ Derived from Latin, *ex volvere*, meaning to unroll, to roll out, and Latin, *alescere*, meaning to grow.

faculty becomes dominant that has yet to reach its level of highest integration. Thus the conclusion is reached that adult life is not one continuous plateau of maturation,

THE MATURITY CONCEPT

The comprehension of maturity as a level of psychologic development is too involved an area of study for a brief account. How-

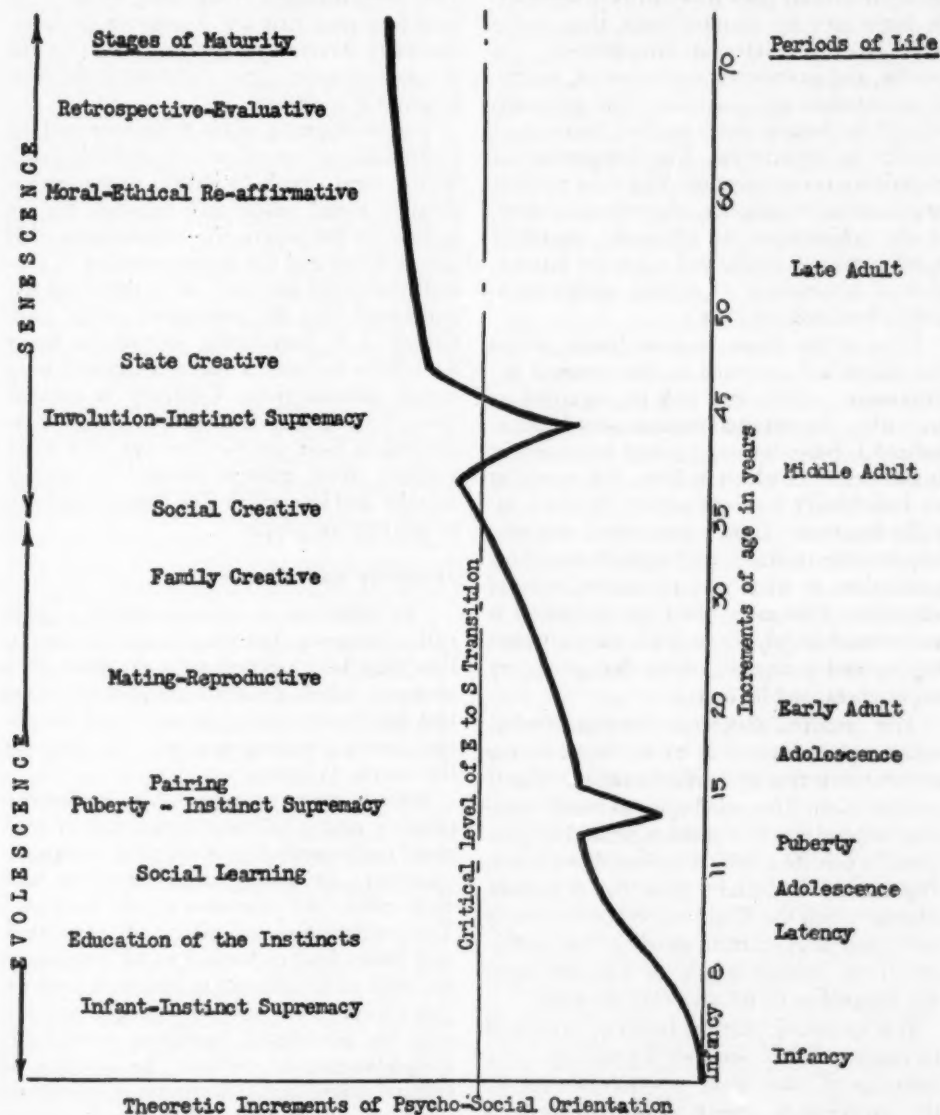


FIG. 1.—The development of social vision in the human life cycle.

but is a series of merging stages, regarded for convenience as early, middle, and late and their subdivisions (Fig. 1). For the sake of clarity a definition of maturity is necessary at this juncture.

ever, a thread of consistency is found to run through all efforts to understand it. The common denominator of varying points of view regarding maturity is *integrated environmental orientation*.

The freshly conceived organism lacks maturity, but it does possess unbridled forces in its infantile state. What is to become of these forces, or how they are to be expressed as the organism goes forward is determined in large part by counterforces that derive both from an internal environment, the psyche, and an external environment, reality. Counterforces are obstacles. The presentation of an obstacle yields conflict. Solution of conflict is experience. The integration of experience is organization. The most efficient organization is maturity. *Maturity, therefore, is the achievement of efficiently organized psychic growth predicated upon the integration of experiences of solving environmentally stimulated conflicts.*

Most of the demands upon forces within the individual are made by the external environment. (This can still be regarded as true when the external environment is internalized.) Since the most potent environment is the society in which he lives, it is seen that an individual's conflicts are in the main socially incurred. Thus, a concept of maturity requires the realization of a psychosocial organization, or what may be termed *cultural direction*. This means that the individual is understood largely through his ways of relating to and comparing with the group, its experiences, and its mores.

The essential difference between evolvence and senescence is to be found in the cultural direction of conflict solution. The E portion of the life cycle begins as nearly complete dependence and is characterized by progressive private rebellion against dependence. Dependence is mainly upon the S culture against which the E bid for independence is expressed as egocentric strivings for gratification of instinct-urges, or pleasure-seeking, regardless of its manifold disguises.

It is axiomatic that the union of groups of no matter what dimensions depends upon the intensity of *sharing of conflict solution* by the participants. Since pleasure-seeking is private and selfish, it is probable that the E state of cultural direction is negative to some degree and tends toward group fragmentation. This would eventuate in cultural disintegration were it not for the S culture with its public orientation, which tends to contain

and to restrain individual instinct-pleasure seeking.

The S viewpoint causes many E strivings to be regarded as dangerous, because if fulfilled they threaten group integration. It is therefore seen that *the S attitude is simultaneously directed toward protection of the E's against social perils and toward the preservation of a culture.*

The development of his civilization and the maintenance of its culture are probably man's loftiest ideal. Such an ideal is of the widest possible social scope and requires for its realization the progressive renunciation of E egocentricity and the development of S protectiveness and altruism. It is therefore hypothesized that the attainment in the individual of S functioning despite its many modalities represents the achievement of a broad cultural vista. Contrary to popular views holding that older people are more restricted in their psychic interests, this study suggests their general outlook is actually broader and less selfish than that of younger, or less mature, people.

STAGES OF MATURATION

The definition of psychic maturity given earlier suggests that the process of maturation may be measured as a resultant of 2 vectors: selfish (instinct-gratifying) drives and culture-directed (protective and altruistic) drives obtaining at any point along the life course (Fig. 1).

Infancy starts as a period of instinct-supremacy and is followed by a series of relationships between the infant-child and his environment, producing experiences that have been called "*the education of the instincts.*" The renunciation and alteration of instinctual drives lead to further social learning in the child as he attempts to achieve a progressive mastery over his own impulses and orients his new-found ambitions toward accomplishments in reality. This increase in cultural orientation that characterizes earliest adolescence is interrupted by bio-physiologic puberty. The psychologic effect of puberty is a resurgence of temporarily concealed drives, a regression toward instinct-supremacy. The process of coping successfully with such inconsistent energies leads to further personality organization in adolescence with the emer-

gence first of *self-identity* and later rudimentary parental attitudes. This proceeds into *pairing*, a psychologic device that allows for the mutual working out of problems of identification and develops attitudes relating to the smallest possible social unit—a group of 2 people of opposite sexes.

The capacity for intimacy growing out of adolescent pairing and the idiocentric psychologic attitudes directed toward the fulfillment of pleasure urges culminate in the *mating and reproduction* of early adulthood. A later phase of early adulthood is then characterized by the beginnings of larger group formations. This may be termed a *family creative* period. The psychosocial organization at this level is relatively small, constricted, and confined to the development of the home-family unit.

Middle adulthood, or middle maturity, then appears as a stage of widening social interest in which the family-society becomes increasingly oriented within the framework of its responsibility toward a greater society. This may be termed a *social creative* period. It is during this period that the progeny are traversing earlier phases of evolence and in which parental attention is directed toward assisting in the integration of offspring wishes with social requirements. Clinical experience gives the impression that people at this phase of maturation are concerned with the social development of the family and the community collective of families.

The involutinal disturbance (cf. below "The Interruptions") is self-limited and is followed by personality reintegration with the advent of the third or late phase of maturity.

Later maturity appears to be roughly divided into 3 sequential segments. The predominant mature point of view in the first segment may be regarded as a *social-political* one, or *culture-organizational*. By this time of maturity the progeny have reached an early adult phase and are themselves in a family creative period. A ruling and protective sovereignty befalls the mature adult at this level as he assumes the parental hierarchical leadership over his family of families. Thus, the scope of interest here becomes wider and is concerned with the creation, ordering, and maintenance of a larger society, or what may

be called the state. Thus, in a sense, the first segment of late adulthood may be called *state creative*.

The second segment of late maturity is ushered in by a set of conditions requiring the establishment of social, moral, and ethical standards. It may be said that at this regulative level in the life cycle it is necessary for the establishment of pacific relationships among the oncoming generations that the parental ruling body draw upon cumulative experience to render decisions, assist in planning, erect social guideposts, and to select subordinate leaders. The judgmental functions of the human mind may be found to be most highly developed during this period. Judgment is created out of actual and vicarious experience with conflict solutions and out of cultural learning. Since cultural standards are established, archetypal, and have withstood the tests of historical application, the necessity for judgmental functioning produces a kind of rediscovery of old values already found effective in cultural maintenance. For this reason, the second segment of late maturity may be called a *moral and ethical reaffirmative* period.

The integration of the mature personality at this level yields a profound concern for system, order, and meaning in human existence and engenders an almost newly found kinship with past (parental) leaders and regard for the current standard-bearers of all the disciplines of culture (technologic, scientific, etc.).

The need to correlate the present with the past to determine the true nature of accomplishments, errors, and rediscoveries ushers in the last phase of late psychic maturity. The area of cultural vision at this level is at its broadest possible development (Fig. 2) embracing one nearly complete life cycle and its interrelatedness with a multitude of other life cycles throughout its span of existence. The individual at this level compares and contrasts his values with cultural values to which he has been longitudinally exposed, and through a process of conscious reasoning and intuition he evaluates meaning and purpose. Intuition is probably unconscious statistical analysis of experience. Hence, this latest period becomes one of *retrospective examination*, and an increased interest in the

history of human development may be found at this level.

It may be said that whereas the early evocent views himself as a potential ambitious and dauntless master of a dimly conceived mankind, the late mature senescent, by contrast, views himself with real humility as at most a contributor or at least a participant in the improvement of his society.

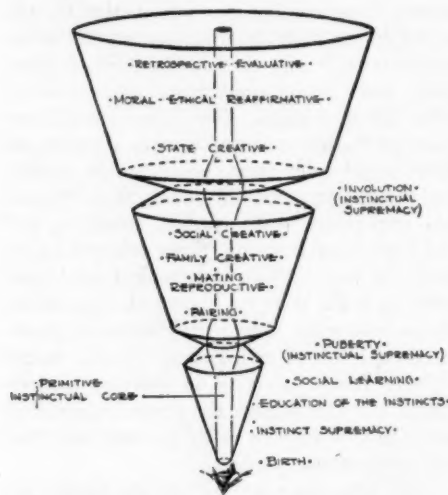


FIG. 2.—Psychosocial orientation. This is a schematic representation of the breadth of psychosocial vision along the course of the human life cycle. Places of narrowing area are periods of instinct supremacy associated with biophysiological upheaval.

THE INTERRUPTIONS

Any period of physiologic upheaval, whether in the form of illness or a stage in growth, eventuates in a psychic disturbance. Emotional defenses elaborated by the individual to handle ordinary living events of the preceding period are excessively taxed during such stages of transition as puberty and involution. A variable amount of loss or diminution of defense-effectiveness occurs with a concomitant threatened break-through of hitherto submerged instinctual and infantile emotional patterns. The need to deal with this internal threatened weakening of psychic structure causes much available mental energy to be concentrated toward an effort to create new bulwarks and repair old ones. Thus, external environmental interest is withdrawn and is internally directed as self-

interest. As a consequence, psychologic growth is held in abeyance either until the physiologic storm subsides or until better defenses regain dominance.

A PLACE FOR SENILITY

It is the common clinical experience with late senescents to find evidence of a psychologic reactive state just prior to the onset of the senile condition. They speak readily of feelings of lowered self-esteem, a diminution of self-confidence, and an increased sense of insecurity. Further investigation almost invariably reveals that they have suffered sociodynamic factors of rejection, exclusion, setting aside, isolation, and neglect. Clinical work with such people yields a high order of improvement on a complete program of environmental manipulation, interested care, and psychotherapy, individual or group. Where the therapies are not applied or are unsuccessful, organic deterioration follows and proceeds to dementia and death.

It is probable that the third interruption to psychic maturation postulated by many investigators is a social illusion. The authors conclude that *senility as an isolable state is largely a cultural artifact and that senile organic deterioration may be consequent upon attitudinal alterations.*

The latter hypothesis is difficult to prove and lends itself to much argument. It is based upon the concept of psychosomatic unity and the realization that the loss or impairment of psychic defenses (resistances) is related simultaneously to a similar impairment of physical resistances. An unbroken cycle ensues unless strong external forces are applied to reinstate psychic structure. Successful therapeutic programs appear to impede the organic breakdown.

CULTURE AND SENILITY

A precise American cultural attitude toward the aged is not easily discerned. Our elders seem neither devotedly revered nor yet unceremoniously excluded. Perhaps our attitude may be described as an amused tolerance and a legally imposed but grudging acceptance.

A partial answer to the question of how such an attitude develops is found in the E-S

conflict discussed earlier. In addition there may be evidence that ours is an E-dominated culture. It is probably the nature of the ego-centric state that its own values are overdetermined. Among the E-values in our culture that may be overdetermined are movement, agility, quantitative productivity, exhibitionistic sexual attractiveness, and artfulness. S-maturity contrasts strikingly with its greater emphasis on deliberation, caution, quality, modesty, and loyalty.

Since the S individuals represent loss of youth, diminution of physical power and stand as supporters of cultural code, advocates of wisdom, and reminders of death, they are scorned by the E's. This disdain for age is implanted in the early E mind as a latent attitude.

The obvious conclusion, therefore, is that as an evolescent progresses into senescence his own latent attitudes toward S are revived and are directed against himself. In other words, in a culture that emphasizes E values the S person expects to be rejected and rejects himself.⁸

STAGES OF SENILITY

When criteria of perceptible behavior and expressed fantasies are evaluated and analyzed, it may be found that actual senility consists of a series of declinations of behavior. The onset is replete with instinct-dominated affects and ideation. This condition of psychic frailty is followed by a period of reparation with return of better social functioning. The term, *senile latency*, may apply here (Fig. 3).

The partially restored psyche, however, fails to endure without environmental assistance and often despite it, so that a further breakdown follows and progresses. The entire process suggests *social unlearning* and what may be called *de-education of the instincts* appears. Each gain in psychosexual evolution and social maturation made in evolescence is progressively dissipated in reverse order—the latest acquired being the first lost.

⁸ If the viewpoint presented here has some degree of validity, then a careful study of elder-venerating cultures (such as the Chinese) should disclose less "senility" among their aged in contrast with elder-discarding cultures.

Thus, language expression progressively deteriorates through stages of decreasing comprehensibility to gibberish and nonverbal communication. An early upthrust of adult-like sexual appetite gives way to masturbatory and perverse orificial sensuality with progressive loss of sphincter mastery and associated fantasies. Partially controlled aggressiveness yields to impulsiveness and acting-out, moving toward wantonness and, finally, toward subsultus. This is accompanied by increased motor incoordination, enfeeblement, and waning of proprioception with inability to maintain erect posture. Affects

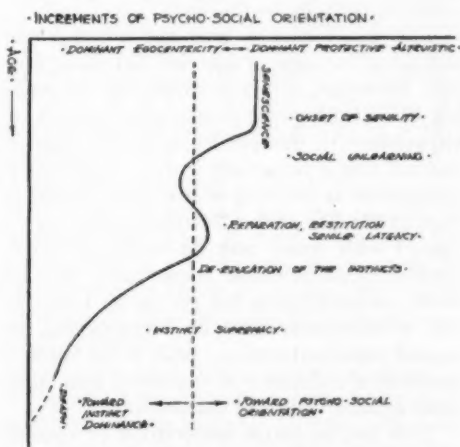


FIG. 3.—Senility. Stages of senile retrogression. This is a magnified continuation of Fig. 1.

change toward a privately enjoyed irritable euphoria. Orientation, related to apperceptive and cognitive functions, regresses to complete withdrawal of interest and comprehension from temporal and spatial relationships. Memory loses its acuity for the present, becomes hyperacute for the remote past, and finally dwindles into near-nothingness. Food tolerance is altered by stages from solids to pap and milk. Exitus is the natural outcome.

The entire picture is one of progressive loss of self-direction toward abject dependency and instinct supremacy. When these stages are evaluated, it may be seen that they resemble, with very little difference, the period *birth-to-puberty in reverse*.

PSYCHOPATHOLOGY AND THE STAGES OF MATURATION

The hypothesis as outlined here presents real and ideal stages of maturation relating to a theoretic personality norm. It is clear that certain of the neuroses are by their very nature immaturity reactions or early E attitudes persevering beyond their archaic origin. Such E viewpoints preserve egocentricity and interfere to some degree with the achievement of S maturity. However, non-neurotic personality elements are subject to progressive maturation. It may be said that the more neurosis warps, hinders, or alters ego development then the less will psychosocial maturation be realized.

This is, of course, true also whether the individual is single or married, barren or fertile. However, if it is assumed that the rearing of a family presents a greater number of experiences of this particular quality, then it follows that a potentially greater degree of S maturation is possible where child-raising is part of the life cycle. But the psyche preoccupied with stress may be rendered nonreceptive to experiential integration. Parenthood obviously does not guarantee maturity and childlessness may be accompanied by considerable maturation. Still, in the latter, a qualitative difference is perceived that militates against complete maturation.

This can be better understood by consideration of another hypothetical probability. Every stage in the organism's physical development is biologically motivated. Since the psyche is a somatic function, physical maturation implies a simultaneous simple psychic ongoing maturation also based on biologic impetus. The psychic function of awareness is directed toward the self and the external milieu. Thus a biologic diathesis for psychosocial maturation may be thought of as endowed in the organism. However, this is merely a primitive groundwork upon which experiential maturation takes place.

The psychoses follow to a certain extent the hypothetical laws pertaining to the neuroses, i.e., latent conflicts out of E antiquity interfere longitudinally with psychic maturation. Psychosis may be regarded as the loss or impairment of environmental awareness and of defense-effectiveness with the breakthrough into perceptible behavior of symbol-

ized latent conflicts. The conflicts leading to psychosis are derived from inadequately solved early E problems, but as they rise toward consciousness and expression their symbolization is influenced by the personality's most recently acquired psychosocial orientation and is colored as to content to some degree by the dominant attitudinal set characteristic of the achieved stage of maturation.

SUMMARY OF THE HYPOTHESIS WITH RESEARCH POTENTIALITIES

The attention of scientists to date has focused on those elements in a life that come to their fullest expression prior to middle age, and are on the wane when middle life is reached. This unbalanced concentration supported by public instruments of communication has provided a distorted view of life as a cycle ending near the middle with the second half a barren interlude preceding one's demise.

This hypothesis predicates a middle-life interruption at or around involution, ending a period called *evolescence* and ushering in a period rich both in actuality and potential called *senescence*. It reserves the term *senility* for a psychopathologic entity frequently occurring in late senescence, which should not be confused with the normal predemise deteriorative state.

With involution as an interruption similar to puberty and with senescence as an unexplored period following involution, much research suggests itself. As is necessary in most research, a descriptive stage is needed here. We need to know the dimensions of senescence not only in terms of the skills and behavior already measured in *evolescence*, but we need to identify the social creative and other attributes that are only beginning in *evolescence* and reach full maturity in the senescent period. We might well do for senescence what Gesell and Amatruda (4) have done for infancy and childhood; i.e., construct a set of development scales by which to look at senescence. Where Gesell has concentrated on physical growth, the student of senescence would concentrate on social growth and social patterns of behavior.

This would offer us new dimensions for the study of intraindividual and interindividual conflict. It is our belief that much intrain-

dividual conflict is conflict of (a) an individual's chronological age, (b) his expectations of himself, and (c) the expectations that others have of him. In a society venerating the values of evocescence or even in its early stage of adolescence, the man entering the later years can but pursue the chimera that the adolescent value represents for him. Measures available to determine his orientation might well serve as a diagnostic tool for his release.

Similar tools could well serve as the measure of interpersonal conflict. Within the family certain unexplained elements of human emotions may find solution through such measures. For example, there is the inference that in a given family the greater the disparity in ages between the E-level offspring and the S-level parent, the greater the difference in psychosocial vision and, hence, the greater the conflict.⁶ In addition, it is suggestive that the closer the E's and S's are in chronology, the greater the mutuality in conflict solution. What is often interpreted as passivity may be altruistic protectiveness attributable to S maturity.

The hypothesis offers a theoretic index of maturation that, if tenable, permits categorization of individuals along a scale of psychosocial achievement. Any considerable difference in a given individual between his testable index level and the expected may be of diagnostic importance, and goal establishment in psychotherapy may be thus facilitated. An index of maturation implies the needs of an individual at a given stage in his development. Thus, his emotional and social requirements, his talents and capacities, and his occupational potential may be managed realistically.

A second area of research related to the first is the delineation and clarification of senility as a pathological process, as opposed to the longer period of which it is but the final rapid stage, senescence. In an era when older men and women are being dubbed

"senile" when they may be acting as older men and women act, this is a serious social problem (see Table 1). If, on the other hand, senility has already begun, it is our belief that research in therapy is both necessary and possible to provide knowledge whereby senility may be deflected from its otherwise inexorable course.

The knowledge of stages of senility may not only assist in prognosis but may also aid in fitting therapy to the peculiarities of the senile condition. For example, the enormous dependency needs and self-isolation of the senile respond remarkably to an independence-fostering program engineered in an integrated group setting. In a large number of such people, physical and psychic decline can be arrested or slowed. This is not designed so much for the purpose of extending longevity as it is to help promote some degree of serenity during the remaining period of life.

There is abundant evidence that the life span is increasing and that our population is aging. The need to employ usefully the added years of creative capacity accruing to people requires study, evaluation, and recognition of the stages of maturation of the complete life cycle.

Once we have descriptive dimensions of senescence with measuring instruments comparable to those available at other stages of the life cycle, and once we can separate age normalcy from age pathology, we can turn our research tools to questions at every stage within senescence and to the borders of senescence and evocescence.

Good descriptive criteria can be used to reflect different medical care programs, recreation, housing, and employment programs in terms of their most pertinent factors—factors that relate to senescence and that find their furthest development and have the greatest pertinence to this period of life.

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⁶ The protectiveness and altruism of S maturity are not to be confused with the overprotectiveness and excessive interest sometimes directed toward grandchildren by grandparents. This latter relationship is very likely a symptomatic and symbolic phenomenon representing hostile, dependent, and restitutive attitudes in the threatened ego.

PSYCHOTHERAPY OF AGED PERSONS¹

II. UTILIZATION AND EFFECTIVENESS OF "BRIEF" THERAPY

ALVIN I. GOLDFARB, M. D.,² AND HELEN TURNER, M. S.³

NEW YORK, N. Y.

Prolongation of life without prolongation of at least minimal social adaptability cannot be considered prolongation of "living." Human living entails some degree of comfort and self-satisfaction, the preservation of dignity, some (even if infinitesimal) productivity, and restraint from unreasonable aggression provocative of retaliation. These are basic goals of psychotherapy. For the aged, who have short life expectancy and limited resources, psychotherapy must be brief and simple. If the aged person can be helped to conserve and put to good use his old effective methods of getting along this may mean the difference between continued residence in the community and hospitalization for mental disorder.

BASIC DATA

In a period of about 3 years, 150 persons with disordered behavior (psychosis, psychoneurosis, or personality disorder), were psychiatrically examined at the Home for Aged and Infirm Hebrews of New York. Their ages ranged from 63 to 91 years with the great bulk of patients in the eighth and ninth decades.

All were found to have lost resources, not only in terms of friends, family, and finances, for which the Home might make substitution or compensation, but they also suffered somatic or psychological handicaps. The deficit of psychological resources due to early acquired inhibition is common at any age; deficits in homeostatic, sensory, effector, and cortical-integrative resources, while not unique to old age, characterize what is known as pathologic aging. The result is impair-

ment of flexibility of functioning for suitable social adaptation: tensions cannot be alleviated and external changes cannot be successfully met by the unaided individual. With such failure of mastery, pleasures are lost and painful situations may arise. Even substitutes for normal gratifications cannot be obtained. A state of frustration and conviction of helplessness, of ineffectuality and vulnerability, ensues and arouses fear. The fear blocks remaining avenues for self-reliant activity of the aged person; this inhibition adds psychologically determined inaction to the already existent physiological (and psychological) deficits. Such curtailment of effectiveness results in increasing helplessness and progressive fall in self-esteem. The aged person feels more and more worthless, incapable of mastery, and fearful, and then by vicious circle all these feelings are accentuated. In consequence the aged person is impelled to seek or force aid, fearfully, angrily, or in combination, from the people around him. Their strength looms as he shrinks in his own estimation. The subjectively helpless aged person seeks parent-surrogate protectors and providers in the same manner as he approached his parent when a child. This approach is modified by an accretion of masking behavior that serves to salvage some self-respect (16), and that has as its gratification the illusion that help is imminent because he can coax it or command it.

Our formulation of clinical observations permits postulating a specific mode of therapy for trial and evaluation. Abraham (1), in his discussion of the value of psychoanalysis in advanced age (by which it appears he means age 40 to 65!), speaks of a group of "obsessional neurotics" who desire the guidance of the physician who signifies to them "the superior father." Our observations indicate that the basic personality structure (12) of the disturbed aged individuals examined inescapably led them to a child-

¹ Read in abbreviated form at the annual scientific meeting of the Gerontological Society, September 7, 1952, Washington, D. C. This research was supported by the Esther and Joseph Klingenstein Research Fund.

² Attending Neuropsychiatrist, Home for Aged and Infirm Hebrews, New York.

³ Research Psychiatric Social Worker.

parent relationship with the physician. This attitude is universal where helplessness supervenes. Such a child-parent orientation is a falsification of reality in which there is sought direct aid rather than help in helping oneself. This perception of the therapist is a reflection of the patient's need and of his own past. The patient's attitudes and his associational flow of conversation reveal this distortion. The security-seeking patient thrusts the role of parent upon the therapist. The opportunity to foster the illusion that a protective parent has been found is therefore ready-made. The therapist may use this delegated parental authority to satisfy the patient's demands for affection, protection, punishment, forgiveness, or respect. In this way the patient becomes convinced of his good standing with the therapist and his self-esteem is increased. This feeling of worth grows out of the relationship nurtured by the therapist. As his self-regard mounts, his sense of helplessness decreases(13, 17).

METHOD OF TREATMENT

With these clinical observations as a starting point, 75 residents referred for psychiatric care were initiated in treatment consisting of as widely spaced and brief sessions as possible. The maximum length of sessions was 15 minutes. The aim in each session was to provide emotional gratification of the patient toward increase in his self-esteem. To achieve this the therapist accepted the role of protective parent thrust upon him and encouraged the development in the patient of an illusion that he had or could call upon the great powers of this strong person.

A patient might be seen twice within the first week and thereafter as infrequently as possible, depending upon the psychiatrist's judgment and reports of the patient's behavior. Almost all patients voluntarily returned for continued treatment and in those whose return was out of fear of consequences of noncompliance this was dealt with as part of the treatment relationship.

An important point in treatment was explanation of the patient's difficulties to general medical, administrative, social service, and nursing staffs of the institution. This was done by means of individual and

staff conferences described elsewhere(9). These conferences encouraged staff attitudes that strongly reinforced the individual psychotherapy and contributed to the improvement and stabilization of our patients.

THERAPEUTIC PROCEDURE IN OPERATION

The therapist as the parent figure attempts to increase the patient's self-esteem by providing emotional gratification. This consists of conducting the treatment in such a manner that the patient leaves each session convinced of "having" the therapist and therefore of taking his protective powers with him. This alleviates the patient's panic. Failing this, he is encouraged to leave with a sense of being as strong as or stronger than the therapist. There is thus a sense of strength obtained through ownership of the therapist's strength because it has been "fed" to him. It is essential that this be achieved in the first few sessions.

The following summarization illustrates approximately what happens in a session. A patient arrives with repressed and suppressed rage about the "bad" treatment he is receiving. This stems from his basic feelings of helplessness and fear, which exaggerate his feelings of need and expectancy for care that are frustrated. If the encounter with the therapist does not alleviate fear through the expectation that help is to come, the therapist encourages the enraged patient to view him as a strong and even threatening figure, an attitude already present in the patient because of the universal readiness to use the physician as surrogate parent who has power to help and therefore to hurt. In the session this potentially threatening figure is won over as an ally. This "victory" enhances the patient's ideas of his skill or talents; the patient thus feels convinced of his mastery of the relationship and of his own power, adding these to the powers acquired in the winning of the therapist. If the patient has been able to vent anger at the therapist (often quite obliquely expressed), to "defeat" him, and then gains the "defeated" but still strong therapist as ally (in that he guarantees continued association and interest), the patient leaves on a note of triumph.

The acquisition of such strength increases self-esteem, the sense of helplessness is decreased, and the concomitant fear and rage is likewise decreased. It is the anxiety following on failure of mastery that causes limitations of activity the capacity for which is actually still present; or it is the angry denial of anxiety and helplessness that through its disorganization of action exaggerates the ineptitude present. With de-

CASE MATERIAL AND RESULTS

Seventy-five patients were referred for psychiatric care by physicians, social service workers, and administrative officers in the Home. Owing to administrative difficulties or deaths, 16 patients were lost to treatment before its efficacy could be evaluated. In 2 of these a diagnosis of brain tumor was made and confirmed at operation. Of the patients treated, 20 were seen less than 5 times, 24

TABLE 1

RESULTS IN 5 CASES OF PSYCHOSES IN ABSENCE OF BRAIN DAMAGE

Sex	No. patients	Age range	No. sessions		Improved	Stabilized	Unimproved
			Range	Average			
M.	2	72-81	3-9	6	1	0	1
F.	3	63-71	3-8	4.7	0	0	3
Total	5	63-81	3-9	5.2	1	0	4

TABLE 2

RESULTS IN 13 CASES OF PSYCHONEUROSES AND PERSONALITY DISORDERS IN ABSENCE OF BRAIN DAMAGE

Sex	No. patients	Age range	No. sessions		Improved	Stabilized	Unimproved
			Range	Average			
M.	6*	63-77	3-10	6	4	2	0
F.	7	67-82	3-22	9	3	4	0
Total	13	63-82	3-22	8	7	6	0

* One with mental deficiency, I.Q.: 70.

TABLE 3

RESULTS IN 41 CASES OF CHRONIC BRAIN SYNDROME WITH DISORDERED BEHAVIOR

Sex	No. pts. treated	Age distribution	Predisposition			Brain damage			Sessions		Impr.		Stab.		Unimpr.	
			Mild	Mod.	Ser.	Mild	Mod.	Ser.	No.	Aver.	No.	%	No.	%	No.	%
M.	11	66-91	2	2	6	6	2	3	92	8.4	6	55	4	36	1	9
F.	30	67-90	2	6	22	11	7	12	259	8.6	14	47	8	26.5	8	26.5
Total ..	41	66-91	4	8	28	17	9	15	351	8.5	20	49	12	29	9	22

crease in anxiety the basic original limitations continue to exist but stripped of their inhibiting psychological elaborations. Increased capacity to deal with social situations follows, "success breeds success," and self-esteem may be automatically maintained. However, when the defects of resources are so great as in the brain-damaged aged person it cannot be expected that realistic mastery can continuously take place and the cycle cannot be self-perpetuating. Then the psychotherapeutic effort must be a continuous or recurrent reinforcing technique.

between 5 and 10 times, and only 15 were seen more than 10 times, with 31 as the maximum number of sessions for any one patient to the present.

The 59 patients treated have been divided into 3 groups (see Tables 1-3): psychoses in the absence of significant brain damage (5 patients); psychoneuroses without significant brain damage (13 patients); and assorted reactions with chronic brain syndrome (41 patients).

Defects of sensorium, neurological signs, or a history of cerebrovascular accident are

common in the aged. Behavior disorder associated with such evidence of chronic brain damage may have been present in some degree before the damage occurred. The behavioral disorder may seem to be the result of altered cerebral-integrative functioning on the basis of defect or release, or it may appear to be a means of compensating for, or defending against, the decreased efficiency of function. Loss of cortical-integrative functioning is, however, the most serious insult a human being can suffer, and if it is not counterbalanced by loss of cortical centers that facilitate anxiety (the frontal lobes?) or by anosognostic deficiencies, it provokes overwhelming anxiety.

While it was recognized that not all aged persons with disordered behavior would have significant brain damage (chronic brain syndrome) this brief technique of treatment was nevertheless chosen with such patients in mind. For aged patients without brain damage more elaborate techniques may be as applicable in the treatment of psychoses and psychoneuroses in the aged as in younger groups. The results of treatment in 41 patients with chronic brain syndrome are found in Table 3.

Our evaluation of results is not in terms of "follow-up" of discharged cases, but in terms of the course of patients treated on a supportive or maintenance basis recurrently or continuously as required. We have categorized results as improved, stabilized, and unimproved. By "improved" is meant change in the patient's social adaptation for the better with or without reinforcing interviews or change in staff attitudes. "Stabilization" was regarded as change in the patient's behavior with decrease in social difficulties resulting in greater tolerance by other residents and staff but without significant increase in the patient's self-satisfaction. The meaning of "unimproved" is obvious.

DISCUSSION OF REACTIONS TREATED

In the group with chronic brain syndrome the reactions were varied and subclassification into "with psychosis," "with psychoneurosis," "with behavioral disorder" was of no great prognostic value.

Psychoneurotic manifestations varied, the commonest being depression. Hypochondri-

asis was frequent, conversion phenomena also were common. Neurological or other disease present often seemed to account for the complaints until psychotherapy proved otherwise. It cannot be too greatly emphasized that many patients, posthemiplegic for example, were invalidated far out of proportion to the cerebral damage suffered by psychological factors. Obsessional features seen were chiefly those of character structure rather than symptom complexes. Phobic reactions were common, but in these aged persons the underlying fear was more directly represented than in psychoneurotic younger people; instead of fear of the dark, of the street, or the subway there were fearful reports of men under the bed, misinterpretation of innocuous remarks in the corridor as indecent advances; instead of dreams of or fear of being robbed, thefts would be erroneously reported and trifles or trash would be hoarded. All this, of course, seems delusional, hallucinatory, and so bizarre as to be called psychotic behavior. These fears of attack and deprivation are clearly rooted in a sense of smallness, helplessness, and vulnerability. Also clear in these patients is the trend toward conservation of resources and desire for protection, together with the rising anger against a threatening world, which is then fearfully accused. This leads to outwardly directed anger or cringing fear. It often leads to depression as the self is accused of failure. A state of apathetic helplessness may yield to an attitude that implicitly accuses not only the self for failure but the human environment of neglect or cruelty. The slim reserve of the aged one's discriminatory capacity has weakened reality testing, and what otherwise might remain repressed, or appear as a dream or fantasy, is reported and acted upon as a fact. The rapid disappearance of such symptoms with treatment, however, leads us to believe many of these "psychotic" manifestations of the aged are a florid display of neurotic phobic reactions.

CONCLUSIONS

This study is essentially an attempt to elaborate on a method of giving reassurance and emotional support to aged people. The method is based on clinical data organized

in terms of observed adaptational efforts of aged persons. Our results are promising. While there is no doubt that a number of these patients would have done fully as well without treatment it also seems clear that treatment reveals a clue as to how they would have achieved their improvement or stabilization. This is the important aspect of supportive treatment; it crystallizes a relationship in which the patient can heal some of his psychological wounds, and it watches and controls this process. Certainly if the patient can find a favorable relationship elsewhere the same healing will occur, but not for our enlightenment and without the assurance that everything possible to help keep it a healing process will be done.

The results of treatment are in accordance with expectations based on well-known psychiatric facts. Past performance is the best criterion for prognosis in cases of disordered behavior; and also the probability of good result in treatment is greater where the remaining cortical-integrative function is greater. When predisposition to behavior disorder is great, a small amount of brain damage may prove enough stress to develop a severe reaction highly resistant to treatment. Conversely, well-automatized patterns of social adaptation may obviate the development of behavior disorder even in the presence of severe brain damage; and where stress does produce mental disorder in such cases, treatment may nevertheless be helpful.

Thus the chief contribution of this study seems to be not so much the elucidation of new facts as indication that, where treatment of chronic brain syndrome with mental disorder may be effective, it can be achieved with the expenditure of very little psychiatric time. It is of great interest that only $7\frac{1}{2}$ hours of a psychiatrist's time spaced over a period of 2 years was the greatest amount of time required in our series of improved patients. Also, one of our most salutary results occurred after 6 sessions or $1\frac{1}{2}$ hours of psychiatric help. In both these patients as in the majority of our cases, presence of organic encephalopathy was verified by psychological testing. In those cases that remained unimproved, this outcome could be forecast very early in treatment.

We have found repeatedly that emotional disorganization often exaggerates the picture of brain damage and makes for mistaken belief that treatment will be futile. Many patients who, on cursory study, might have passed as "confused" and "senile" individuals, were found on psychiatric examination to be psychoneurotic in the absence of significant degree of brain damage. As a corollary it therefore seems worth while to give all cases of disordered behavior in aged people a trial of treatment.

Our results indicate that, while our treatment is ineffective in psychosis, it is of some value in psychoneurotic and allied disorders of the minimally brain-damaged aged. In the group with chronic brain syndrome, the results were better than expected. Changes in psychological and social functioning were achieved that permitted continuance of residence in the Home for Aged and Infirm Hebrews for patients who were referred when transfer, usually to a mental hospital, seemed to be the only solution.

The authors wish to acknowledge their indebtedness to Dr. Frederic D. Zeman, Chief of the Medical Services, The Home for Aged and Infirm Hebrews of New York, for his active encouragement and advice in the preparation of this paper.

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MEASUREMENT OF CHANGING PSYCHOPATHOLOGY WITH THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY¹

MAJOR LOUIS J. WEST, USAF (MC)

During the last war there was a great need for rapid evaluation of personality disorders. Devices for screening and techniques for preliminary evaluation of patients were utilized in an effort to conserve time. The Minnesota Multiphasic Personality Inventory (MMPI) was found to be of considerable value, and has been widely used by clinicians in the last 5 years. By the end of 1950 there were more than 250 references to the MMPI in medical and psychological literature. The recent appearance of an atlas for the clinical use of the MMPI(15) has provided a complete bibliography as well as a summary of experience with the test at the University of Minnesota. Details of scoring and interpretation are available in the standard manual(14).

The MMPI consists of 550 items in the form of statements, *e.g.*: "I have a good appetite." "Most of the time I wish I were dead." "Sexual things disgust me." "I am more sensitive than most other people." These are sorted by the subject into categories of "True," "False," and "Cannot Say." This provides a broad, inclusive anamnesis that covers a great many facets of the psychobiological unit. Nine clinical scales were derived by statistical comparison of the responses of many normal people with the responses of a variety of psychiatric patients. In addition, 4 scales were devised to evaluate the validity of the record and the attitude of the subject. Fig. 1 shows a normal profile. The 4 validating scales are on the left. The Question Score (?) is based on the number of items put in the "Cannot Say" category. The Lie Score (L) indicates the degree to which the subject may be attempting to deceive by choosing responses that put him in the most socially acceptable light. The Valid-

ity Score (F) checks the validity of the record as a whole, and is elevated when the subject is careless, badly confused, or uncomprehending. The K Scale is a measure of motivation to make a "good" or "bad" record, and is elevated when the patient is defensive in the test situation. An automatic correction of certain clinical scales is made on the basis of the K factor.

The 9 clinical scales were named according to the primary diagnosis or outstanding psychopathology of individuals in the groups of patients used in the construction of these scales. They are (numbered from left to

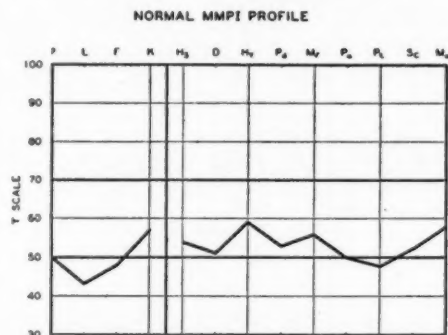


FIG. 1.—Four validating scales on the left. Nine clinical scales on the right. T score of 50 is the norm. Elevations over 70 usually considered significant.

right): 1. Hypochondriasis (Hs); 2. Depression (D); 3. Hysteria (Hy); 4. Psychopathic Deviate (Pd); 5. Masculinity-Femininity (Mf); 6. Paranoia (Pa); 7. Psychasthenia (Pt); 8. Schizophrenia (Sc); 9. Hypomania (Ma). This system of numbering the scales is utilized in coding test results, thereby permitting comparison and classification of profile patterns (13, 29).

In scoring, raw scores are converted to T scores, with 50 representing an arbitrary norm. Ten points on the T score are equivalent to one standard deviation, so that in the profile a score of 70 on any scale represents 2 standard deviations above the norm. Scores over 70 are considered significantly elevated,

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From the Department of Psychiatry of Cornell University Medical College and The New York Hospital.

The author is indebted to Miss Myrtle Guy for assistance in scoring the tests administered to patients of Payne Whitney Clinic.

and scores under 70 may be significant when occurring as peaks in certain profile configurations. Recently, attempts have been made to avoid the limitations of diagnostic classification, through interpretation of test profiles as a whole rather than on the basis of individual scales considered separately. This trend has been greatly facilitated by utilization of coding as noted above.

Difficulties in accurate evaluation of profile interpretation arise from the fact that the most valuable use of the test data is in conjunction with the clinical data in any one case. Attempts to construct general diagnostic profiles based on the testing of a number of patients with a given diagnosis have been inadequate because of variations in psychopathology within diagnostic categories. Current practice avoids the use of the MMPI to "make" diagnoses. Greater value is derived from a more flexible application based on interpretation of profile patterns in terms of general personality characteristics and psychopathological trends. The value of this approach was noted by Hunt (18) who stated that "... more sophisticated and dynamic interpretation of the MMPI may have clinical validity."

Space does not permit a detailed discussion of profile patterns and their interpretation. The reader is referred to the bibliography (2, 6-8, 10, 15, 17, 19, 20, 23, 24, 27). It must be pointed out that a psychopathological approach to profile interpretation is essential. For example, a schizophrenic patient may be severely depressed, with great bodily over-concern and somatic delusions accompanied by marked ruminative, obsessive preoccupations; these symptoms may coexist with bizarre ideation, disorganized thinking, and other psychopathology of the basic schizophrenic illness. Such a case might have scores on "D," "Hs," and "Pt," all higher than "Sc." Yet to the experienced user of the test, the configuration of the profile as a whole could clearly suggest the correct diagnosis as well as the general psychopathology. In each case the diagnostic formulation should be made by the clinician, utilizing psychological tests together with many other sources of data to obtain an over-all picture.

The weaknesses and limitations of the test

should be kept in mind. The scales differ in sensitivity and specificity. Well-organized paranoid individuals sometimes succeed in concealing much of their psychopathology. Male homosexuals can occasionally effectively lower their "Mf" scores when striving to deceive. Close interrelationships of "Pt" with "Sc" and of "Hs" with "Hy" may lead to marked secondary elevations that can be interpreted only through experience with the test. Anxiety causes elevations in the "neurotic triad" of the first 3 clinical scales. Elevations of "Pd" and "Ma" are sometimes seen in the records of individuals who are markedly immature emotionally but who are neither psychopathic personalities nor hypomanics. A certain percentage of "test misses" and "false positives" occurs. Like any laboratory test in clinical medicine, the MMPI must be used in conjunction with clinical observation and other data.

With these limitations in mind, the following valuable features of the MMPI present themselves:

1. It is easy to administer and score.
2. It is conservative of time.
3. Interpretation is readily learned.
4. A permanent record of 550 items is provided. This may be used for item analysis, for obtaining dynamic leads, for the development of further scales, and for scoring old tests with newly developed scales.
5. Items cover most phases of the total psychobiological unit and each item is given equal status with the others; the effect of the interviewer's personality and bias in selection of questions is avoided.
6. Standardization in the test's construction has made its validity and reliability known in statistical terms.
7. It is well accepted by most patients.

A review of literature reveals that studies involving serial testing with the MMPI have been relatively few. Modlin (20) mentioned the concept of repeated testing, which he found dependable in following the clinical course and helpful in determining prognosis. Rashkis and Shaskan (21) found a high correlation of psychometric evaluation and clinical estimates of results in group therapy. Brozek, Guetzkow, and Keys (3), Henderson *et al.* (16), and Schiele and Brozek (22) found correlations between MMPI profile

changes and personality changes of men undergoing dietary restrictions. Abramson(1) noted that alcohol often produced quantitative score changes without altering profile patterns. Schofield(25) made a statistical study of responses to various therapies. Sweetland(28) altered test profiles in several subjects by hypnotic suggestions of personality change. There are reports (4, 5, 9-12, 26) in which the prognostic value of MMPI profiles is emphasized.

At the New York Hospital during 30 months prior to January 1952, the MMPI was administered to 33 hospital personnel, 184 psychosomatic patients, 96 patients on various other clinical services, and 112 psychiatric patients, many of whom were re-tested during this period. The present study originally utilized serial testing of 19 inpatients of Payne Whitney Psychiatric Clinic, with clinical diagnoses as follows: psycho-neurosis, 7; schizophrenia, 4; alcoholism, 3; agitated depression, 2; manic-depressive, depressed, 1; paranoid state, 1; and psychopathic personality, 1.

All these patients were carefully and frequently re-evaluated psychopathologically over a period of months, during which time the MMPI was administered from 2 to 5 times at varying intervals. The clinical picture was found to correlate well with the test profile at each testing, and clinical changes were accompanied by comparable changes in test profiles. More than 30 additional serially tested cases have confirmed the observation that MMPI profiles predictably and consistently change as psychopathology changes. The following are 10 typical examples selected from the original group.

CASE 1 (Fig. 2), an 18-year-old college student with a diagnosis of schizophrenia, was first tested 2 weeks prior to completion of a course of subcoma insulin therapy. He was somewhat anxious and obsessively preoccupied with minor physical defects, showing resentment, aloofness, arrogance, hostility, and a concentration difficulty. Six months later, further moderate improvement was noted following a second course of insulin. He was more friendly, sociable, and cooperative. Anxiety was diminished somewhat, he was more optimistic, took some night school courses and did well. The test profile change reflects the mild symptomatic improvement, decreased anxiety, improved sociability and self-control, decreased bodily overconcern, and growing optimism.

CASE 2 (Fig. 3), a 26-year-old ex-pilot with a diagnosis of paranoid schizophrenia, was admitted with delusions, hallucinations, and a severe thinking difficulty. He received subcoma insulin therapy with some improvement. At the time of testing he appeared bland, with inappropriate affect and only slight apparent anxiety. Superficially friendly and cooperative, he often seemed remote and preoccupied, and admitted ideas of reference of a nonthreatening but rather bizarre nature. Over the next 2 months

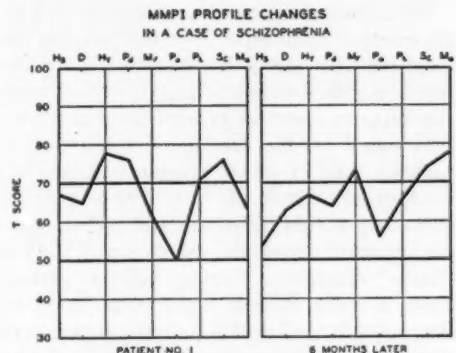


FIG. 2.—Mild symptomatic improvement with decreased anxiety and increasing optimism, sociability, and range of interests. Note the "Sc" remains unchanged.

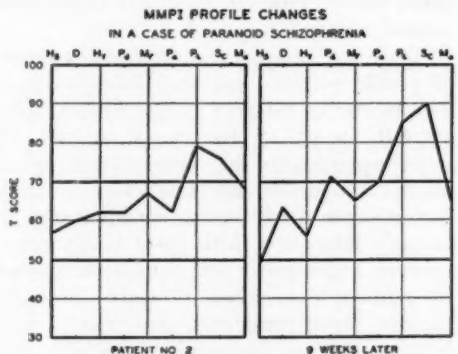


FIG. 3.—An exacerbation in a paranoid schizophrenic illness.

he became steadily worse, with progressive withdrawal from reality, increasingly bizarre delusions and fantasies, and severely disorganized thinking. The increasing severity of the illness is reflected in the rising profile.

CASE 3 (Fig. 4), a 23-year-old college student with a diagnosis of schizophrenia, was admitted with a history of lifelong maladjustment and recent personality change with vague fears, bizarre dreams and fantasies, marked withdrawal, frequent tearfulness, and suicidal thoughts. He listened compulsively to a single phonograph record over and

over, was childishly impulsive, indecisive, unable to concentrate, and had resorted to large amounts of alcohol for sedation. He was tested upon admission. Strongly supportive psychotherapy and controlled environment produced considerable diminution in his fears and a general clinical improvement. When retested 10 weeks later, psychopathology was diminished in intensity generally and this change is seen in the altered profile. Note that the basic configuration of the profile remains unchanged.

MMPI PROFILE CHANGES
IN A CASE OF SCHIZOPHRENIA

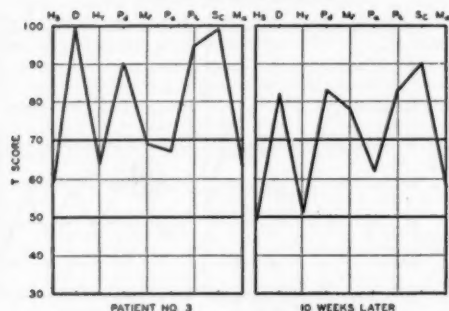


FIG. 4.—General symptomatic improvement with considerable psychopathology remaining. Note that the configuration of the profile has undergone little change.

MMPI PROFILE CHANGES
IN A CASE OF CHRONIC ALCOHOLISM

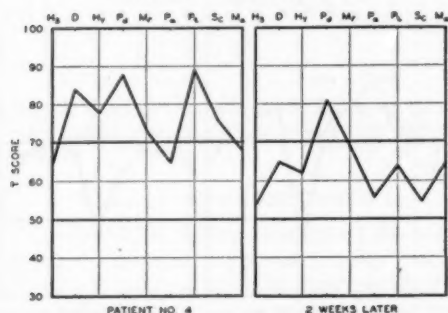


FIG. 5.—Rapid symptomatic improvement. The basic personality disorder (psychopathic personality) remains clearly indicated.

CASE 4 (Fig. 5), a 53-year-old real-estate salesman diagnosed psychopathic personality with chronic alcoholism of 15 years' standing, had a long history of impulsive behavior, poor judgment, many jobs, and failure to live up to the promise of his intelligence, education, personal charm, and good family. For 6 months prior to admission he had been drinking a quart of whiskey daily with general deterioration. At time of initial testing on admission he was anxious, tense, depressed, obsessively preoccupied with his alcoholism and failure in life compared with a brilliant, successful brother. Concentration was poor, appearance was disheveled, and he was tremulous and restless. The patient was retested

2 weeks after admission. Appearance was much improved, tremor was gone, anxiety and depression were no longer manifest, and he was working on business papers. Despite underlying tension, he was polite, charming, and cooperative. The future was seen optimistically and he insisted upon leaving the hospital to attend to business. The profile reflects rapid clinical improvement, but clearly indicates the basic personality disorder (psychopathic personality) with the persistent peak on the Pd scale.

MMPI PROFILE CHANGES
IN A CASE OF DEPRESSION

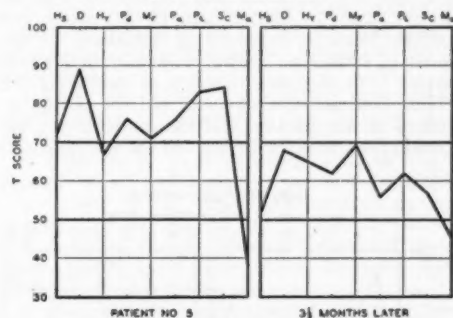


FIG. 6.—Considerable improvement following electroconvulsive therapy.

MMPI PROFILE CHANGES
IN A CASE OF DEPRESSION

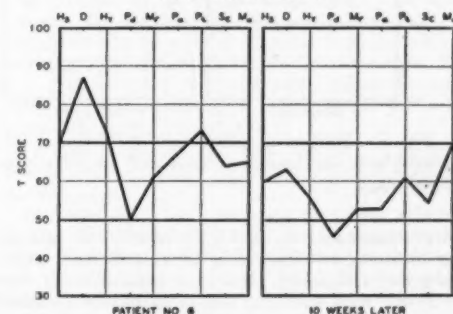


FIG. 7.—Considerable improvement following psychotherapy.

CASE 5 (Fig. 6), a 43-year-old professional man with a diagnosis of depression with paranoid features, had become increasingly depressed over a 3-month period. Ten days prior to admission, delusions of reference and persecution developed, with the feeling that the future was hopeless. He made an abortive suicidal attempt and was hospitalized. He was found to be markedly depressed, anxious, tense, somewhat retarded, suffering from many paranoid and depressive delusions. Ten electroconvulsive treatments were followed by marked improvement in the clinical picture. This is clearly reflected in the profile obtained 3 1/2 months later, shortly before he resumed his successful career.

CASE 6 (Fig. 7), a 59-year-old housewife with a diagnosis of reactive depression, was admitted fol-

lowing increasing symptoms of depression over a 4-month period. She showed tearfulness, insomnia, anxiety, indecisiveness, restlessness, fatigability, memory difficulty, and obsessive concern over her husband's failing health. She responded well to psychotherapy. Ten weeks later, she had returned to her usual personality. The change is reflected in the profile pattern.

CASE 7 (Fig. 8), a 29-year-old housewife with a diagnosis of mixed psychoneurosis, was admitted 9 months after the birth of her first child. She had been anxious, depressed, and preoccupied with obsessive fears throughout most of this postpartum period. Markedly depressed on admission, she was anxious, suspicious, fearful of insanity, and preoccupied with obsessive thoughts of murdering her child. Concentration was poor and the patient appeared so disorganized that the diagnosis was uncertain for a time. In the hospital she was childishly

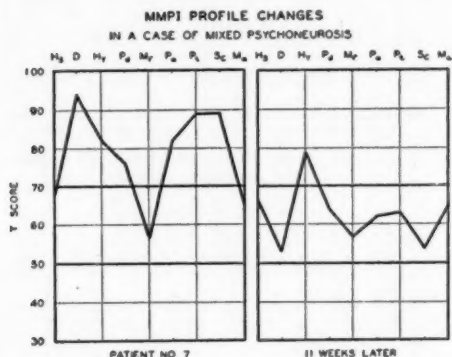


FIG. 8.—Marked symptomatic improvement following subcoma insulin therapy and intensive psychotherapy.

dependent, anorexic, panicky, insomniac, with feelings of unreality and impending doom, and many vague physical complaints. Intensive psychotherapy was utilized, with subcoma insulin to handle resultant anxiety. When the patient was retested, the clinical picture had improved considerably. Emotional control was good, anxiety was much diminished, many fears were allayed, concentration was better, she appeared cheerful and well groomed, obsessive preoccupations were much fewer and less intense. She was still overdependent and somewhat anxious. During continued psychotherapy this patient had many symptomatic ups and downs; additional test profiles followed these fluctuations in a remarkable way.

CASE 8 (Fig. 9), a 54-year-old housewife with a diagnosis of mixed psychoneurosis, was admitted with a history of progressive indecisiveness, irritability, tension, restlessness, concentration difficulties, anxiety, and depression over a 4-month period. In the hospital she responded quickly to psychotherapy with a rapid improvement of all symptoms, and

when retested prior to discharge was found by her family and friends to be better than she had been in years. The profile reflects the rapid return to health.

CASE 9 (Fig. 10), a 41-year-old housewife, with a severe agitated depression, had developed delusions of disease, auditory and visual hallucinations, and a variety of physical symptoms shortly after admission to the hospital. Following 7 electroconvul-

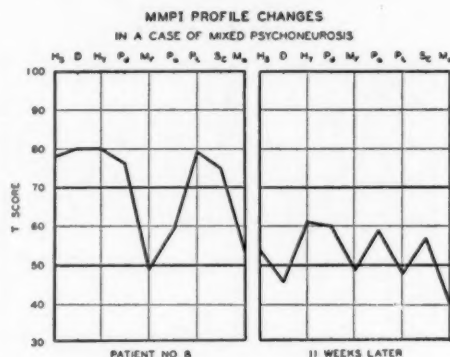


FIG. 9.—Marked improvement in response to intensive psychotherapy.

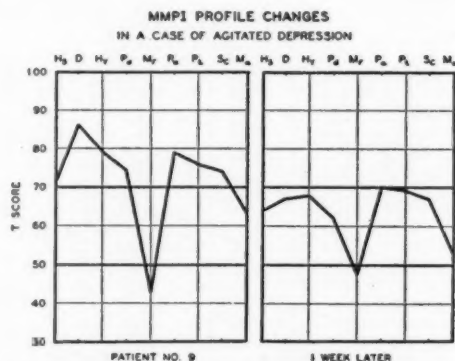


FIG. 10.—Rapid improvement following a course of electroconvulsive therapy.

sive treatments she improved very rapidly, and was first tested 3 weeks after the last convulsive treatment. She was still anxious, depressed, insecure, dependent, and seeking reassurance constantly. During the subsequent week she improved so fast that she was retested. Integration was much better, appearance and conversation were normal, physical complaints were diminished, she was cheerful much of the time, and remarked that she "felt herself again" for the first time in months. She was still somewhat anxious, dependent, and watchful. The test profile kept pace with the clinical change in this phase of rapid improvement.

CASE 10 (Fig. 11), a 37-year-old housewife with a diagnosis of mixed psychoneurosis, was admitted with a history of increasing anxiety, tension, and depression over a period of 6 months, during which she may have had conversion symptoms. Her life situation was exceedingly difficult and painful, and many of her symptoms were clearly reactive. She was constantly tearful, indecisive, "terribly depressed" and hopeless, fearful, and preoccupied. A marked concentration difficulty was noted, along with poor grooming, agitation, restlessness, insomnia, anorexia, and many vague physical complaints. She responded well to psychotherapy and environmental manipulation, and was discharged 4 months later much improved. Two months subsequently she was retested, at a time when her life situation was greatly improved, and she was mildly elated at success in becoming pregnant. "It's the first time I've felt this happy for years." The recovery from the illness and the current mild elation were reflected in the profile obtained at this time.

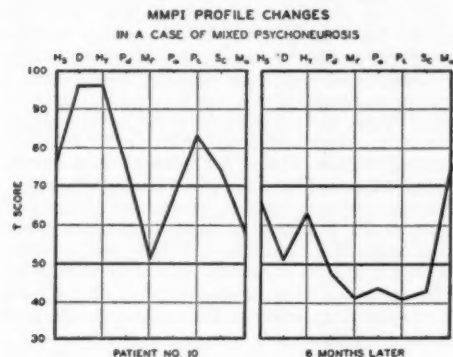


FIG. 11.—Marked improvement following prolonged intensive psychotherapy, with a mild elation appearing.

SUMMARY AND CONCLUSIONS

The MMPI is widely accepted as the best of the questionnaire-type personality tests. It is simple to administer and score, conservative of the clinician's time, well accepted by patients, and provides an extensive anamnesis and a graphic indication of psychopathological status that is easy to interpret. It should not be used as a substitute for the physician's history-taking (which is so important in the early development of a therapeutic relationship), nor should it be used alone to "make" a diagnosis. With experience in the use of the MMPI, characteristic profiles can be recognized as indicative of personality structure and disturbance that are not limited to diagnostic categories of any particular school. Examples have been selected to demonstrate

how the MMPI can be used in measurement of *changing* psychopathology, thus indicating its value in analysis of clinical progress and results of treatment.

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DISCUSSION

DR. BURTRUM C. SCHIELE (Minneapolis, Minn.).—This paper, simple and unpretentious though it is, effectively demonstrates the way in which an objective psychological instrument can be used to evaluate therapeutic progress—a procedure that is still all too rare in psychiatric practice.

At the University of Minnesota our staff have accumulated over 8,000 profiles on our own cases in the past 12 years. About $\frac{1}{3}$ of these were on my own psychiatric inpatient service. From this experience, I would like to make certain observations:

1. The limitations: The MMPI is really a rather simple device that is limited in its scope and occasionally produces a normal profile in the face of definite clinical psychopathology. Though it is of definite diagnostic value, diagnosis is not made by the test alone. There would have been less misunderstanding on this matter if the scales had been numbered in the first place (as they now are) rather than being named after psychiatric diagnostic groups. Like many other medical tests (EKG, X-ray, etc.),

there is no automatic reading and interpretation is slowly acquired with extended experience.

2. The objective nature and the fact that the test takes none of the physician's time are self-evident and need to be mentioned only for emphasis.

3. The multiphasic nature of the instrument is one of its most important clinical values. It assists in pointing out unseen features and the mixture of symptoms that occur in almost every diagnosis.

This point is illustrated by the case of a young woman with a mild depression that was responding satisfactorily to psychotherapy. Clinically she had given no evidence of schizoid tendencies by the third week of observation and treatment. At this time the Multiphasic profile was obtained and it revealed, in addition to the expected elevation on the depression scale, an unexpected and rather high elevation on the Sc scale. The psychiatrist's first reaction was that the test was wrong. He knew the patient quite well by now and had seen no evidence of any schizoid tendencies. In order to check the significance of this unexpected Sc elevation, the positive responses on the Sc scale were reviewed with the patient (item analysis). When asked why she had responded in the affirmative to the item "I have unusual experiences" she replied, "Every time I go into the woodshed at home, I see my dead father's face." Other items brought forth similar unexpected responses, adequately confirming the Sc elevation obtained on the profile. Subsequent events in this patient's life confirmed the presence of strong schizophrenic features in her personality difficulties. Without the MMPI these schizoid features would have unquestionably come to light sooner or later. However, it is an undeniable advantage to have an instrument that so effectively surveys the patient's psychopathology with so little effort on the part of the physician.

4. Although this instrument was originally designed as an aid in diagnosis, it is equally valuable for repeated retesting. At our hospital, for example, we routinely prescribe this procedure at the beginning of treatment, at the end, and, in many cases, at significant points along the way (e.g., at termination of special therapy). As Dr. West has indicated we find the test a reliable indicator of the patient's current condition. In Minnesota, at least, it is being used as much for this latter purpose of evaluating as for the original purpose of aiding in diagnosis.

FRONTAL BONE HYPEROSTOSIS IN PSYCHOSES

A CLINICAL STUDY

J. NOTKIN, M.D., POUGHKEEPSIE, N. Y.

Reports on the occurrence of hyperostosis in the inner table of the frontal bone in psychotic patients are not very frequent. As we had an opportunity to study 9 such cases within the last few years, we thought it advisable to report them. Before citing the cases it may not be amiss to review briefly the literature on this subject.

Morgagni(1) in 1761 was the first to draw attention to the combination of hyperostosis of the inner table of the skull with virilism and obesity. Stewart(2) described 5 cases of psychosis with localized calvarial hyperostosis in 1928. Morel(3) reported in 1931 a syndrome of obesity, polyphagia, polydipsia, disturbance of sleep, muscular weakness, loss of sight, headaches, and occasional epileptic seizures with the cranial bony changes. Cases were also reported by Van Bogaert(4) in 1930, Schiff and Trelles(5) in 1931, Moore(6, 7) in 1936, Eldridge and Holm(8) in 1940, and Hemphill and Stengel(9) in the same year.

Prescott(10) having found in 1944 in a 22-year-old male schizophrenic hyperostosis in the frontal bone and calcification of the falx cerebri, examined roentgenologically 56 male and 64 women patients with various types of psychoses and noted the characteristic bony changes in 9% and 11% respectively. In a smaller group studied by him later the percentages were 11 and 29. DiLascio(11) in 1945 reported 2 cases.

Mussio-Fournier and associates(12) reported in 1947 frontal hyperostosis with obesity, narcoleptic attacks, and cardiovascular changes in a 39-year-old man.

Warter *et al.*(13) reported in 1948 a case of a woman of 56 who showed signs of pronounced asthenia, anorexia, and depression. She showed frontal hyperostosis and calcification in the falx cerebri.

In 1948, Ivins(14) reviewed 1,500 skull x-rays of psychotic patients admitted to Delaware State Hospital and found in 11 cases evidence of hyperostosis frontalis interna. It is of significance that all 11 patients were females.

Summaries of the 9 cases in our series, also all female, follow.

CASE HISTORIES

CASE I.—M. A. C., a 49-year-old woman, was admitted to Hudson River State Hospital June 29, 1946, because of gradual mental deterioration. One brother was of worrisome disposition; otherwise there was no indication of mental disease in the family and collaterals. She made poor progress in school, stayed home all her life, had no social contacts, and never was engaged in any gainful occupation. At the age of 32 following the death of her father she began to complain of headaches and was losing weight. After the age of 42 she became reticent, forgetful, and gradually lost interest in her surroundings. She sang ditties with much repetition. Her legs became weak and she had to be cared for in bed. Six months prior to hospitalization she became totally disoriented and sang in a loud voice, repeating the same song over and over again. She finally was unable to grasp simple questions. However, 2 weeks prior to admission she spontaneously complained of headaches, became quite disturbed, and threw objects about the house. As she could no longer be cared for in the home she was hospitalized. On admission she was very childish, silly, and totally disoriented. She perseverated and displayed a tendency to echolalia. She obeyed simple commands, such as showing her tongue. She was unable to name objects. During the first 2 weeks she was quite noisy; she sang, laughed, and generally appeared to be euphoric. She was incontinent, could not feed herself, and had to be spoon fed. She was childish in her manner. She would spontaneously declare, addressing the examiner, "I like you." Other times she would exclaim, "Mommy, mommy, I'm a good girl." No coherent or relevant reply could be obtained from her. She frequently referred to herself as the "nice little girl."

She was 4 ft. 5 in. tall and weighed 79 pounds. Her gait was spastic paretic and the associate movements in both arms were suppressed. All deep reflexes were exaggerated to the point of clonus. Abdominal reflexes were absent, Babinski sign was positive bilaterally and so were all the confirmatories. Because of her mental condition, the sensory findings could not be determined. The cranial nerves showed no involvement. B. P. was 110/84. X-ray of the skull showed thickening of the internal table of the frontal bone with marked hyperostosis. Red blood cells: 3,248,000. Hemoglobin: 49%, color index: 0.76, white blood cells: 6,650, polymorphonuclears: 56%, large mononuclears: 4%, Lymphocytes: 4%. Blood sugar 91 mg. per 100 cc., blood calcium 30 mg. per 100 cc., cholesterol: 145 mg. per 100 cc., urea nitrogen 15.9, creatinin 1.0. Blood

and spinal fluid Wassermann negative. There were two mononuclear cells: protein 31 mg. per 100 ml. The colloidal gold curve consisted of zeros. Basal metabolism rating 0.

Patient gradually developed signs of cardiac decompensation and died December 15, 1947, of cardiac failure. Post-mortem studies could not be made owing to objection of relatives.

CASE 2.—B. C., a 55-year-old woman, was admitted January 21, 1947, because of a long-standing psychotic condition for which she could no longer be cared for at home. Her sister had a psychosis and was treated in a state hospital. Patient was born in the United States. Her mother died shortly afterwards and patient was then reared by a great aunt. Her childhood was unhappy. She was frequently whipped for mild misdeeds and was generally neglected. She completed eighth grade in school and then went to work as a telephone operator. At the age of 19 she contracted syphilis and received intensive treatment. A year later she had a hysterectomy, bilateral salpingo-oophorectomy, and an appendectomy. At the age of 22 a change in her personality was noted. She became reckless in her expenditures and domineering in her manner. She was noted as being flighty in her conversation. She was sent to the Neuropsychiatric Institute at Ann Arbor and shortly afterward was transferred to Pontiac State Hospital, from which she was discharged 6 months later with the diagnosis of manic-depressive psychosis. During the next few years she was seen on 3 occasions at the Receiving Hospital in Detroit and it was the impression of the staff of that institution that the patient was a hebephrenic *præcox*. On July 29, 1938, at the age of 46, she was committed to Ypsilanti State Hospital. At that time she was confused, talkative, irritable, and distractible. She remained in this state until early in 1940 when she improved, only to relapse after a short while, this time becoming quite delusional. She complained of being "doped." However, she again improved and was released July 28, 1943. She worked as a domestic 3 months and then declared that she was incapable of carrying on with her duties. Nevertheless she remained outside of the hospital until 1946, when she was picked up in a confused condition by the police in a New York upstate city. On admission to Hudson River State Hospital she was disoriented and very incoherent. Emotionally she was silly, spoke of her "Arab" husband, used extremely obscene and profane language, and was belligerent.

She was 5 ft. 6 in. tall, 164 pounds in weight. B. P. 150/90. X-ray of the skull showed hyperostosis of the inner table of the frontal bone and calcification of falx cerebri. Blood calcium: 13 mg. per 100 cc. Phosphorous: 6.0 mg. per 100 cc. Blood sugar: 135 mg. per 100 cc. Blood cholesterol: 140 ml. per 100 cc. Urea nitrogen: 10.1, creatinin: 2.0, uric acid: 4.1. Blood and spinal fluid findings were normal. Basal metabolism rate: minus 8. Fasting blood sugar: 135 mg. per 100 cc., first specimen following glucose 247 mg. per 100 cc., second specimen 273 mg. per 100 cc. Urine glucose showed a diabetic curve.

CASE 3.—F. M., a 70-year-old woman, was admitted July 7, 1947, with a history of acting childishly for many years. She was born in Ireland. Relatively little data were available concerning her early life. She was married and widowed many years ago. She had no children. She used to spend her time sitting on her porch and pounding nails for long periods and generally behaving in a rather bizarre manner. On admission she complained of severe headaches and noises in her ears. She admitted difficulties with her neighbors and reported that she hit one in self-defense. She was totally disoriented in all spheres and emotionally quite unstable. Following admission she has been noted as being at times restless, crying, and appearing depressed, other times rather jolly and facetious. On occasion she had unmotivated outbursts of laughter. She remained confused.

She was 5 ft. 2 in. in height, weight 184 pounds. B. P. 162/90. Hearing was impaired. There was a systolic murmur in the aortic area and heart was slightly enlarged to the left. She had no neurological signs. X-ray of the skull showed hyperostosis of the frontal internal table of unusual degree. Blood sugar: 260 mg. per 100 cc., blood chloride: 890 mg. per 100 cc., creatinine 1.6, cholesterol: 242, calcium: 13.2, phosphorous: 5.1. Urine sugar: .85%, second test: 1.2%, third test: 2%. Blood and spinal fluid findings were normal. Basal metabolism: + 13.

CASE 4.—T. D., a 59-year-old woman, was admitted November 24, 1947, with a negative family history and an uneventful early personal history. She was born in New York City; after graduation she became a milliner and also worked as a salesclerk. Married at the age of 33 and had 2 children. Married life was happy. At the age of 39 had a cyst removed from her right breast and at the age of 57 the same breast was removed as it became cancerous. Menopause began at the age of 54. Patient took an occasional drink, used no drugs, and did not smoke. She was said to be very friendly and neighborly; liked swimming, movies, and sewing; had many friends. Following the death of her husband in 1942 when patient was 54 years old she began to neglect herself and her housework. Her son was at that time in service and she would address letters to herself and put his name in the upper left-hand corner. She seemed to have realized at that time that she was ill and agreed to be taken to the Medical Presbyterian Center in New York City in 1944. There she was given electroshock treatment and was sent home somewhat improved. Following a mastectomy in 1947 patient became mute, refused to do anything, couldn't recall the names of her friends, and generally appeared to be confused. Since then her condition, especially her memory, has gradually become worse, necessitating hospitalization to Hudson River State Hospital. At that time she was restless, uncooperative, and negativistic. She cried profusely. She gave her name correctly but was unable to give any other information concerning herself. Later she was noted as being restless and uncooperative, requiring sedatives for sleeping. She

showed no spontaneity, was incoherent in her stream of mental activity, and showed paucity of ideas. She expressed no delusions and did not react to hallucinations. She was emotionally silly. Her memory was very poor. She was disoriented.

Her weight was 101 pounds, height 5 ft, 2 in. B. P. 150/90. Except for slight tremor of head and fingers, she showed no positive neurological findings. X-ray of the skull revealed an area of calcification within the vault in the mid-parietal region and thickening of the internal table of the frontal bone. Blood calcium: 11.5 mgs. Serum inorganic phosphorous: 3.4 mg. Blood and spinal fluid Wassermann: negative. Colloidal gold test: 2, 3, 4, 5, 5, 5, 6, 6, 3, 5, 2. Protein content: 42 mg. per 100 ml. Basal metabolism: +24. Fasting blood sugar: 93 mgs., 30 min; after 1st glucose 130 mgs.; 1 hour later: 109 mgs. Urine: negative for sugar at the same intervals. Creatinin: 1.1 mgs.; urea nitrogen: 12 mgs.; cholesterol: 22 mgs; urea: 24 mgs.; sed. rate: 7 mm in 60 min. Red blood cells: 5,084,000; white blood cells: 8,200; hemoglobin: 102%; color index: 1; polys: 38%; lymph: 60%; bands: 2%; basal metabolism: +24.

CASE 5.—G. V. L., a 66-year-old woman, was admitted to Hudson River State Hospital June 18, 1948. She came from English Congregational stock. A paternal first cousin had a "nervous breakdown." The patient was born in Boston. Little was known of her infancy or childhood except that she grew up in pleasant, friendly middle-class surroundings in Cambridge. She received public grammar and high school education. Thereafter she studied art for 4 years. Met her husband when he was a student at Harvard Law School and married when she was 30 years old. Patient had few illnesses including bronchitis and influenza in 1918. She fell on the floor in 1943 fracturing her patella. She was said to be friendly, gentle, and placid with interests in painting. Has always been a gracious hostess. In 1939 patient had a sudden attack of anxiety while alone in a museum feeling she would lose her speech. She recovered rapidly from that attack. In 1943 two months after she accidentally fractured her patella, she became depressed and agitated. She was given 5 electroshock treatments and improved. She maintained this improvement until April 1946 when she became disturbed again. Following another course of shock treatment she improved. In the fall and winter of 1946-1947 she had a period of over-activity but gradually she became depressed. She complained about the radio, was undecided of trivial matters, and refused to leave her home. She was first taken to New York Hospital, Westchester Division January 13, 1948, where she was agitated, depressed, frequently requiring tube feeding. She was then sent to the Hudson River State Hospital, where she was frequently agitated. She was disoriented and generally showed signs of intellectual impairment. She was passively resistive and generally uncooperative.

Her weight was 140 lbs.; height, 5 ft, 5 in., blood pressure 150/90. Heart sounds were indistinct; had slight cyanosis of finger nails. X-ray of the skull

revealed evidence of thickening of the inner table of the vault of the skull in the frontal region. Lateral view of the dorsal spine revealed moderate kyphosis. Red blood cells: 5,962,000; white blood cells: 12,500; color index: .91; polymorphonuclears: 57%; large mononuclears: 4%; lymphocytes: 28%; eosinophiles: 1%; blood calcium: 11 mgs. Blood phosphorous: 3.3 mgs. Cholesterol: 318 mgs. Blood sugar: 97 mgs. Creatinin: 1.6 mgs. Urea nitrogen: 10.0. Nonprotein nitrogen: 35 mgs. Sugar tolerance: 77 mgs. fasting; half hour after glucose: 131 mgs.; one hour later: 180 mgs. (mild diabetic curve). Urine: faint trace of albumen. Blood Wassermann: negative. Spinal fluid Wassermann: negative. Cells 0. Colloidal reaction: 1.1, 1.5, 2.5, 3, 3, 3, 2.5, 2.5, 1.5. Protein 47 mg. per 100 ml.

CASE 6.—A. B., a 62-year-old woman, was admitted October 10, 1948, with a history of depression, agitation, excitement, and self-depreciatory delusions during the preceding 3 months. Her parents both died at quite advanced ages, 101 and 96. Otherwise there were no unusual traits in members of the family or in collaterals.

A. B. was born in New York City. Her early life was uneventful. She married but marital relations were not very congenial. When her husband died (at unstated time) patient went to work as a laundress, which occupation she kept up until shortly prior to her hospitalization in 1948. There was little information available concerning her personality traits except that she was "a home girl."

She became progressively depressed from June 1948, also somewhat disoriented. At times she was overactive and occasionally expressed self-depreciatory ideas.

On admission to hospital she appeared downhearted. She gave the information that she was operated for uterine tumor many years ago and that her menses ceased then. She said she worried over the fact that she had no home, felt sometimes as though she was being punished for some unknown reason. Admitted occasional headache and dizziness. She could not give the name of the hospital, thought it was in Massachusetts. During subsequent residence in the hospital she became rather agitated and restless. She complained of poor memory and confusion. She felt that something happened to her but could not explain what. Her weight was 130 pounds; height: 5 ft, 4 in. Blood pressure 140/80. Blood calcium: 11.1 mgs. Blood phosphorous: 4.4 mgs. Blood cholesterol: 196 mgs. Blood count normal. Sedimentation rate: 1 mm. in 10 minutes, 2 mm. in 20 minutes, and 8 mm. in 60 minutes. Blood and spinal fluid negative. Fasting blood sugar: 82 mgs., 2nd specimen: 185 mgs., 3rd: 182 mgs. (mild diabetes). Urea nitrogen: 10.0 mgs. Nonprotein nitrogen: 30 mgs. Creatinin: 1.8 mgs. Basal metabolism: +8. X-ray of the internal table of the frontal bone showed pronounced evidence of hyperostosis. There was also calcification of the falx and irregular calcification overlying the right frontal area, which was suspected to be calcification in the coracoid. There was a suggestion of thickening of the internal table of both parietal bones.

CASE 7.—M. Mc. G., a 62-year-old woman, was admitted August 18, 1949. Her family history was negative. She was born in Albany, N. Y. Her early life was unknown. She never had any occupation. She was married at an unknown age and married life was supposed to have been congenial. She was said to have a happy disposition and was a good housekeeper. At about the age of 56 she began to have periods of irritability and depression. She brooded over the death of her 7-year-old son years ago. She lost interest in things, became confused, and was finally sent to this hospital. On admission she was resistive and uncooperative. She showed a marked perseveration in speech and was disoriented. She was 5 ft, 4 in. tall and weighed 165 lbs. She had a soft systolic mitral murmur. B. P. was 110/70 and vessels were elastic. She showed no abnormal neurological signs. Roentgenologic examination of the skull revealed exostosis of the internal table of the frontal bone. Blood Wassermann was negative. Blood calcium: 11.55 mgs.; serum inorganic phosphorous: 3.83 mgs.; cholesterol: 275 mgs.; creatinin: 0.882 mgs.; urea nitrogen: 9.8 mgs.; fasting blood sugar: 97.2 mgs.; 30-minute specimen: 164.6 mgs.; hour specimen: 167.4 mgs.; sugar tolerance test: mild diabetes; blood count: normal.

During hospital residence she continued to be irritable and resistive. She displayed extreme poverty of ideation. She was irrelevant in her replies and as a rule repeated questions or her own statements. She showed disorientation in all spheres. Emotionally she was at times somewhat flippant and almost euphoric.

CASE 8.—M. D., a 56-year-old woman, was admitted July 26, 1950. Her family history was essentially negative. She was born in Albany, N. Y. She had an uneventful infancy and childhood. She finished one year of high school at the age of 17. She then entered a convent. However, less than a year later she left the convent and shortly afterward married. She had one child, a boy, to whom she was greatly attached. She divorced her husband because of his supposed unfaithfulness. It is unknown when the divorce took place. Following this she took care of her son and lived by herself for a number of years. At the age of 50 she remarried. Her second husband objected to what he considered unnecessary worries about her son, whom she has spoiled a great deal. This led to some dissensions between her and her husband. She had no serious illnesses except that at the age of 39 she underwent a curettage for endocervicitis. A year later she accidentally sustained a fracture of a nasal bone and a sprained ankle. Her husband described her as a happy sort of a woman. She liked to go out socially and to dance. She also liked to cook, sew, and keep house. However, he thought that she was inclined to be rather extravagant in her purchases of unnecessary trinkets and gifts. In 1950 she began to complain of "aches and pains everywhere." She became more lavish in her purchases. She also became suspicious of people, claiming that they were talking about her. She then took a strong dislike

to her husband and she refused to do anything in her home. He, therefore, took her to the psychiatric department, Albany Hospital, on July 2, 1950. There she expressed the same delusional ideas. She was given psychotherapy and was released 2 weeks later. As she continued to be delusional her husband took her again to the same hospital July 16. At that time she was overactive, elated, and talkative. She had violent emotional outbursts. She spoke of seeing people in the air. She was transferred to Hudson River State Hospital 10 days later. At that time she was very talkative, circumstantial, and incoherent. She admitted spending money on gifts but maintained that these gifts were necessary. She admitted hearing voices, chiefly that of her mother. A short while after admission to the hospital she spoke of hearing "whisperings." She heard voices whisper "Oh, poor Mrs. D." She also showed evidence of intellectual impairment. She was unable to give the name of the hospital and could not tell how long she had been in the hospital. As time went on her productions became more incoherent, her emotional reaction inappropriate, and her memory more impaired. Because of this rather unusual mental picture of impairment, especially in the absence of any local signs, an x-ray of the skull was taken that showed definite evidence of exostosis of the internal table of the frontal bone.

She is 5 ft, 1 in. tall and weighs 111 pounds. She shows no abnormal neurological signs. Blood pressure: 138/84. Blood calcium: 10.5 mgs. Serum phosphorous: 3.44 mgs.; cholesterol: 180 mgs. Creatinin: 1.2 mg. Urea nitrogen: 10.4 mg. Fasting blood sugar: 94.5 mgs. First-hour specimen: 167.4 mgs. Second-hour specimen: 124.2 mgs. Eryths: 4,640,000; leuc.: 6,500; polys: 44%; lymph.: 50%; eos.: 2%.

CASE 9.—H. T., a 60-year-old woman, was admitted May 14, 1951. Family history of mental and nervous disorders was denied. She is of French and English descent. Her infancy and childhood were apparently uneventful. She had a high school education. Her activities after completion of school are not known. She married at the age of 32, and had 2 children. The marriage was happy, and she was a good mother. Her husband died of cancer in 1935. She was in an automobile accident at the age of about 40, details not known. At the age of 50 she slipped on an icy step and fell injuring her spine. She had been complaining of pain in the back ever since. She also complained for a number of years of "a nervous stomach." As her husband left her penniless when he died, patient went to work in a shirt factory. She often assumed the problems of her children and worried a great deal about them. She was high-strung and nervous. During the last 4 years she has been complaining of feeling tired. She could not sleep well and was greatly annoyed by the traffic noises. In April she had a dizzy spell while at work and was forced to go home. She remained in bed for a week. Since then she has had many colds and has been complaining constantly of various pains. She attempted to go back to work but was physically unable. She had

3 or 4 dizzy spells during the last year. At times she regurgitated food and was nauseated. Sometimes she would cease to talk for a while. She became forgetful.

On admission to hospital she appeared confused. She wandered around the room. She said that she couldn't sleep, complained people were against her and men were talking about her because they were acting in a peculiar manner. She claimed that the trouble started about 4 years before. She was afraid someone might harm her. She realized that her memory was poor. She was partially disoriented. About 3 days after admission she became negativistic and evasive when she was questioned. Her replies were meagre and at times irrelevant. There was also a tendency to confabulation. She was poorly oriented and showed mental tension defect.

She was 5 feet, 2 in. tall, weight: 106 pounds. B. P. 140/110. She showed no positive neurological signs. The roentgenological examination revealed thickening of the internal table of the

show some departure from normal but not as outspoken as reported by others. Blood calcium was found to be increased in only Case 1 who had 30 mgs. per 100 cc. Cases 2 and 3 showed an increase to 13.0 mgs. and 13.2 mgs., which cannot be considered as excessive, while the other 6 cases showed a calcium concentration from 11.5 to 10.5 mgs. The inorganic phosphorous content was normal with the possible exception of the 2d and 3d cases, who had 6.0 mgs. and 55.1 mgs. respectively. The blood cholesterol was somewhat raised in the 3d, 4th, and 7th cases and quite high in the 5th case amounting to 318 mgs. The fasting sugar was high in the 2d and 3d cases. The sugar tolerance test showed a diabetic curve in these 2 cases and

TABLE 1

LABORATORY FINDINGS

Case No.	Weight	Blood pr.	Bl. sug.	Bl. cal.	Bl. phos.	Urea nitr.	Creat-inin	Chol.	Bas. met.	Sug. toler.
1	79	110/84	91	30.0	..	15.9	1.0	145	0	....
2	164	150/90	135	13.0	6.0	10.1	2.0	140	- 8	Diab.
3	184	162/90	260	13.2	5.1	...	1.6	242	+ 13	Diab.
4	101	150/90	93	11.5	3.4	12.0	1.1	220	+ 24	Norm.
5	140	150/90	97	11.0	3.3	10.0	1.6	318	....	Mild Diab.
6	130	140/80	82	11.1	4.4	10.0	1.8	196	+ 8	Mild Diab.
7	165	110/70	97	11.5	3.8	9.8	0.8	275	....	Mild Diab.
8	111	138/84	94	10.5	3.4	10.4	1.2	180	....	Norm.
9	106	140/110	84	10.5	3.5	11.4	1.9	180	....	Brdl.

frontal bone. Blood calcium: 10.5 mgs. Phosphorous: 3.52 mgs. Cholesterol: 180 mgs. Creatinin: 1.08 mgs. Urea nitrogen: 11.4 mgs. Fasting blood sugar: 84.8 mgs. Hemoglobin: 14 mgs. —91%. Erythrocytes: 4,524,000; color index: 1.0; white blood cells: 9,400; poly's 75%; lymphs: 20%; bands: 4%. Basal metabolism rate, —2%. Fasting sugar: 102.8 mg.; one-hour specimen: 161.2 mg.; 2-hour specimen: 158.6 mg.

While in hospital she became elated and silly; her intellectual deterioration became more pronounced.

DISCUSSION

Considerable significance was ascribed by various workers to certain laboratory findings in cases with exostosis frontalis interna. Blood calcium and blood phosphorous concentration were held to be increased. Other changes were seen in the cholesterol content and in the blood sugar concentration. The laboratory findings in our 9 cases (Table 1)

mild diabetic curve in the 5th, 6th, and 7th cases. Basal metabolism rating was done in 5 cases, one of which showed a rather high rating of plus 24 while the other 4 had ratings within normal limits.

Many of the authors refer to obesity as one of the most frequent symptoms in these cases and it is looked upon as an indication of an endocrine abnormality. Among our 9 cases one could be considered as obese with a weight of 184 lbs. Two weighed 164 and 165 pounds respectively, which cannot be considered too high. These 3 cases and none of the others showed any definite endocrine signs. As to the neurological findings, only the first patient showed very definite evidence of involvement of the central nervous system, while the others showed no positive findings.

Stress was laid in the early reports on the fact that this syndrome occurs more fre-

quently among women. This point seems to be borne out by our own 9 cases. Nevertheless, Prescott pointed out that a more routine x-ray examination of hospital patients reveals the fact that the male sex is the subject of this disorder just as frequently as women are.

Our group is relatively small to permit a comprehensive discussion of the relationship between the frontal bone changes and the accompanying psychoses. By necessity, therefore, only theories of speculative nature can be offered.

There is the possibility that the pathologic environment of the brain and the possible endocrine disturbances produce alteration in the individual as a whole and so activate the pre-existing abnormal elements in the personality ultimately releasing the psychosis. In favor of such a view can be invoked the fact that this syndrome was seen by several observers in various types of psychoses including schizophrenia, manic-depressive psychosis, involutional psychosis, and epilepsy. In our own material Case 2 started with what seemed to be a manic-depressive type of psychosis at the age of 22; the 5th case had an episode of anxiety at the age of 48 and at the age of 52 a deep depression; the 6th case started with an agitated depression; the 8th showed for a while a mixture of schizophrenic, manic-depressive, and psychoneurotic elements, and the 9th case expressed neurotic complaints for several years before she began to show evidence of intellectual deterioration.

A second possibility is that the psychosis could be the result of interference with the function of the brain by direct action of the structural bone changes, as it was observed in the first case, which showed definite neurologic signs.

A third possibility is that both the psychosis and the bony changes are the result of some common unknown cause. In favor of such a possibility is the fact that 5 of our cases, which started with various functional types of psychosis, finally changed into organic reactions while the other 4 cases showed signs of organic mental deterioration practically from the beginning. This final organic mental deterioration in all instances

would suggest the possibility of such a common cause.

SUMMARY

Frontal bone hyperostosis in psychoses was observed in 9 women.

Certain laboratory changes, especially in blood cholesterol content and blood sugar tolerance, were noted.

Obesity was not observed as a characteristic feature.

Five cases began with functional types of psychosis, later showing evidence of organic mental deterioration.

Four patients had organic mental reactions from the beginning, one showing pronounced neurologic signs.

CONCLUSIONS

The pathological environment of the brain and the possible endocrine disturbances may produce alterations in the individual as a whole and so activate pre-existing abnormal personality traits.

The psychosis could be the result of interference with the function of the brain by direct action of the structural bone changes.

The psychosis and the frontal bone changes may be the result of a common unknown etiologic factor.

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COMMENT

BREVITY

Brevity when overdone defeats the primary purposes of communication: truthfulness and comprehensibility. Witness the misleading newspaper headline or the penny-wise and enigmatic telegram. Nonetheless, brevity like economy has considerable merits. To be brief as well as clear does not reduce what you have to say—it gives you the chance to say more in the same space. Your readers want substance for the time they give you. In short, jewels. *Multum in parvo* at first attracts and then satisfies. So some devices for saying briefly but exactly what you mean may deserve attention.

Avoid long words whenever short words will serve us well or better. The word *end* saves 8 letters over the word *termination*. *Has* has a like advantage over *possesses*. *Anticipate* means to take action in expectation of something: *expect* therefore saves 4 letters and says what most people think they mean when they magniloquently write *anticipate*.

Write short sentences whenever you can. If you arrange your thoughts to follow each other logically then your sentences, though short, will hang together clearly.

Though the poet, the essayist, or the novelist achieves his desired effect by using words having just the connotations he wishes, the scientist uses words that denote precisely what he means. So, among other things, look out for any part of the verb *to be*. *To be* has six different connotations. That should put you on guard. Don't write "the over-all nature of the movement of vehicles in the city of Detroit was found to be a source of annoyance to the police." Put a transitive verb in place of that word *was* and you will find yourself using 6 words, "traffic in Detroit annoyed the police," thus saving 18 words with which to express some additional fact or idea. I have found that merely getting rid of any form of the verb *to be* in favor of a transitive verb usually saves about 16% of wordage.

Since the verb *to be* appears in the passive voice of all verbs, e.g., "it was observed that," I venture to say that the excessive impersonality of authors who use the passive continuously succeeds merely in forcing their readers' attention to die a lingering death. Suppose A.B.C. and X.Y.Z. write a paper to-

gether. Why the agonized modesty of, "It was observed by one of us (X.Y.Z.) that" when "X.Y.Z. noted that" says the same thing in one-third of the space? Often the sentences beginning with *it* and followed by the passive verb, e.g., "It was felt that" or "It was recognized that," omit any mention of who did the feeling or the recognizing and thereby add an irritatingly irresponsible vagueness to stuff-shirted verbiage.

Don't make the neurotic assumption that since you can't write easily and well, other people must just have a knack. Nor divorce Sweat to marry Envy. Professional writers find writing hard too, but they have no airy excuses such as "after all I'm not a writer—I'm a research man": I would suppose the erasers of their pencils nearly always wear out long before the leads. Indeed, most success in writing a clear, truthful, and concise account of anything depends more on your ability to rewrite, condense, and tenaciously edit your own stuff—from the first through the fourth draft—than on what appears in first writing. A first draft that takes an hour to write may well take 4 to 12 hours of revision—preferably at well-spaced intervals.

Nouns and verbs always provide the core of language: choose them carefully. Every time you use nouns in the plural, e.g., "solutions," ask yourself, "Do I mean all solutions? Or many? Or some? Or few? Or, as a matter of fact, just exactly how many?" Beware of abstract and collective nouns. They frequently mean different things to different readers: they denote no one thing because they have too many connotations. They harbor vagueness. They encourage evasiveness. They shelter irresponsibility. You can make effective use of one of the following adverbs before the verbs in scientific papers: *always, often, sometimes, or never*. Such practice will sometimes improve your logic and reasoning, even before you reach the final draft.

To achieve real excellence you will revise at least once and exclusively to eliminate uselessly repetitious words and phrases, or even sentences. "The vain repetitions that the heathen use" may occur near or far from the one necessary word or phrase. This common fault often shows itself only if you will read

aloud once or twice. Useless repetitions occur almost inevitably unless you make a preliminary outline of the right sequence in which to present your statements even before starting the first draft.

Above all else remember that easy writing usually makes damned hard reading.

P. S. The above contains 800 words more or less. Six hours of work—about one hour

of thinking over, putting down and arranging rough notes, an hour for the first draft, and 4 hours at rewriting and revision; rather easy writing and therefore I fear rather hard reading. By no means complete: only some suggestions that work well if put to work. And the verb *to be* used verbally only once—viz., “To be brief. . . .”

ALAN GREGG, M. D.

PALEOPHOBIA

“‘History,’ Stephen said, ‘is a nightmare from which I am trying to awaken.’”

Henry Ford doubtless agreed with these words of James Joyce. For him history was “bunk.” He was concerned with the present—his own monumental present—and so, unmindful of the ill-starred Sicilian expedition and of a later nautical adventure by Philip the Second, he sailed his Peace Ship to Europe to “get the boys out of the trenches before Christmas” of 1914.

But Henry Ford was not the cause of the current down-with-the-past movement; he was merely one of its symptoms. Already education was changing its colors. The classics were being dropped from school curricula or accorded minor importance. The “dead” languages (as if languages that permanently assert themselves in the vast majority of our English words can be called dead) were replaced by “living” ones, or better still by “practical” subjects, such as mechanics—the building and operating of machines which have transformed a civilization that showed some of the qualities of culture into an age of engines that obviously requires none.

One of the most disturbing contemporary expressions of paleophobia is in “modern” art. Scoffers have hinted that psychiatry enrolls more queer practitioners than any other discipline, but, if by their works we shall know them, we humbly submit that preeminence in this respect must be accorded to “modern” art, at any rate to its *avant-garde*. It may be difficult for the ordinary philistine who happens to like pictures and thinks that Italian renaissance canvasses have virtue to understand why certain products of the front line painters of today are found hanging in art galleries; their manifestos seem to savor of the anarchic, to defy all logic and to obliterate whatever authentic canons have been accepted in the past.

The world has been treated to an egregious example of paleophobia (or is it the enmity of the inferior toward the superior?) on the walls of the General Assembly of the United Nations—the Leger murals, so aptly characterized by General Eisenhower’s classic remark. Perhaps M. Leger’s credo may be discerned from his statement some years back: “I deny absolutely the subject and perspective. I introduce the object reacting on a plastic ensemble. . . . Today a work of art must bear comparison with the manufactured object. The artistic picture is false and out of date . . . , etc.” To “deny absolutely” is not, it may be suggested, a logically defensible use of language. Furthermore, we are not told with what manufactured objects the amorphous aggregations of pigment in the UN murals bear comparison.

In education “progressive” and permissive techniques have crowded out such old-fashioned ideas as discipline and order, and in our time the exercise of inhibitions that hitherto had been esteemed procedure in individual training tends toward obsolescence. Here is another manifestation of newness with implied or expressed disparagement of oldness, that does not seem to have contributed materially to the improvement of society.

But in science the gains of today have been made possible by the laborious steps of all the yesterdays; and in psychiatry as in all of medicine the history is a step-by-step process. We take note of the mistakes of the past, we profit by them, we do not ridicule them—in pride “*zu schauen wir vor uns ein weisser Mann gedacht, und wie wir’s dann zuletzt so herrlich weit gebracht.*” The teachings of the past were not always wrong. Who will say that those of the present are always right?

NEWS AND NOTES

DR. ZILBOORG RECIPIENT OF ISAAC RAY AWARD.—At the annual meeting of The American Psychiatric Association in Los Angeles, Dr. Gregory Zilboorg received the Association's \$1,000 Isaac Ray award, for his professional contributions to the field of legal problems connected with mental disorders. Dr. Zilboorg will deliver six lectures on "The Psychology of the Criminal Act and Punishment" at Yale University on October 14, 21, and 28 and November 4, 11, and 18, under the joint sponsorship of the Law School and the School of Medicine. The lectures will then be published by Harcourt, Brace & Co.

Dr. Zilboorg is chairman of The American Psychiatric Association's committee on the history of psychiatry, clinical associate professor of psychiatry at the New York Medical College, and associate clinical professor of the New York State University Medical School. He is also chairman of the section on historical and cultural medicine of the New York Academy of Medicine, and author of several well-known works, including the oft-quoted *History of Medical Psychology*.

The Isaac Ray Award, commemorative of Dr. Isaac Ray, a founder and early President of The American Psychiatric Association, is given annually to a lawyer or psychiatrist with a view to furthering understanding between the two professions in questions of forensic psychiatry.

MCGILL UNIVERSITY DEPARTMENT OF PSYCHIATRY.—On April 17, 1953, the department of psychiatry of McGill University, along with the Allan Memorial Institute of Psychiatry, celebrated the tenth anniversary of its establishment. The program presented a distinguished array of speakers from the United States and other parts of Canada, and culminated in a dinner at which Dr. G. Lyman Duff, Dean of the Faculty of Medicine of McGill University, proposed a toast to the department of psychiatry. He pointed out the exceptional growth of the department in the fields of teaching, research, and clinical work; research itself had reached such pro-

portions as to constitute a national asset to Canada.

FOUNDATIONS' FUND FOR RESEARCH IN PSYCHIATRY.—The Social Research Foundation has made a grant of approximately six million dollars for psychiatric research to Yale University and requested the Corporation of Yale University to establish the Foundations' Fund for Research in Psychiatry. The distribution of the fund will not be confined to Yale.

The new foundation will be administered by a scientific board of directors, not more than 2 of whom may be from one institution. The directors appointed by the Yale Corporation are as follows: Fredrick C. Redlich, M. D., professor of psychiatry, Yale University School of Medicine, chairman; Charles D. Aring, M. D., professor of neurology, Cincinnati College of Medicine; John D. Benjamin, M. D., research psychiatrist, Child Research Council, University of Colorado; Vernon W. Lippard, dean, Yale University School of Medicine; David Shakow, Ph. D., professor of psychology, University of Illinois College of Medicine; George W. Thorn, M. D., professor of medicine, Harvard Medical School; and John C. Whitehorn, M. D., professor of psychiatry, Johns Hopkins University.

After the first-term appointment (2 to 5 years) directors will be elected by the Board for a term of 3 years but may not be re-elected within less than one year.

At its initial meeting held in New Haven on March 27 and 28, the Board of Directors discussed organization and general policy questions. It expressed interest in the training and support of competent investigators, in the development of appropriate research methods, in encouraging the pursuit of significant problems, and in the advancement of the basic behavioral and biological sciences as related to psychiatry. The Board invited communication of ideas from interested sources but will not be ready to make decisions on grants for at least six months.

Dr. Sibylle Escalona, research psycholo-

gist in the Child Study Center of Yale University, was appointed Executive Officer of the Foundation, whose temporary address is 333 Cedar St., New Haven 11, Conn.

NEWS FROM HOLLAND.—From Professor Dr. L. van der Horst of Amsterdam comes the following summary of developments in Holland:

The Dutch Association of Psychiatry and Neurology has formed a section on neuropathology, which includes pathological anatomy and histopathology of the nervous system. There is, in Holland, a growing interest in psychosomatic medicine. In addition to the team that started in Amsterdam with the help of the Rockefeller Foundation, there are now functioning psychosomatic teams in Nijmegen under Professor Prick and in Leiden under Professor Carp. There has been a second printing of the book, "Anthropological Psychiatry," by van der Horst and co-workers, indicating that in Holland interest has shifted from clinical psychiatry and the subject has become multi-dimensional, whereas the application of psychoanalysis and existential analysis has tended to be restricted to problems of diagnosis and treatment. The Dutch psychiatrists are planning to organize a postgraduate course this year for specialists and physicians in order to keep them informed of the new ideas in psychiatry.

PSYCHIATRY IN BRAZIL.—From Professor A. C. Pacheco E. Silva comes the following report:

Psychiatry in many ways has received a great impulse in Brazil during the last few years. The National Department for Mental Diseases, under the direction of Professor Adauto Botelho, has constructed a large number of psychiatric hospitals in the less developed states of the country. In the medical schools of the 2 largest universities the teaching of clinical psychiatry has been reorganized into a 2-year course. Psychosomatic medicine is included. At the Faculty of Medicine of Sao Paulo a new psychiatric clinic (capacity 200 patients) is nearing completion. Planned and directed by Professor Pacheco E. Silva, the clinic will serve for psychiatric teaching and research purposes as well.

MENTAL HYGIENE IN PERU.—The Peruvian Government has established a Mental Hygiene Department, in order to concentrate under the Ministry of Public Health all work pertaining to prevention and treatment of mental disorders. Dr. Baltazar Caravedo, Jr., has been appointed chief of the new department, which will initiate research activities in the field of mental health. A Mental Hygiene Institute is to be established, to serve as a psychiatric hospital for the city of Lima and as a research center, as well as a center for the training of neuropsychiatric personnel. Dr. Caravedo will welcome bulletins, reprints, and other publications of mental health departments in the United States and Canada.

CONGRÈS DES MEDECINS ALIENISTES ET NEUROLOGISTES DE FRANCE ET DES PAYS DE LANGUE FRANCAISE.—This Congress will hold its 51st meeting at Pau, July 20-26, 1953. Dr. Montassut of Villejuif will speak on psychiatry and psychosomatic medicine; Professor Paillas of Marseille on neurosurgical epilepsies; and Dr. Deniker of Paris on laboratory tests in forensic psychiatry. The program will include visits to local psychiatric hospitals. An excursion into the Basque country and Spain is being arranged.

PROCEEDINGS OF SECOND RESEARCH CONFERENCE ON PSYCHOSURGERY.—Publication of these Proceedings is announced by the National Institute of Mental Health; they are available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at a price of 75 cents per copy. The Second Research Conference met in June 1950, under the chairmanship of Dr. Fred Mettler of Columbia University, to discuss evaluation of change in patients after psychosurgery. Dr. Winfred Overholser edited the Proceedings.

CALIFORNIA SEXUAL DEVIATION RESEARCH.—A third annual report of the findings of the California survey research on sex crimes and delinquencies has been prepared, dated January 1953, printed by the Assembly of the State of California. The report includes a review of the scientific literature on sexual deviation, a dissertation on methods in

sexual research, papers on the psychophysiologic study of sex deviates, a survey of sex crimes in California, including those against children. Dr. Karl M. Bowman contributes the introduction and conclusions, in which he stresses the need for long-term studies.

NEW YORK STATE DEPARTMENT OF MENTAL HYGIENE.—Dr. Newton Bigelow, Commissioner of Mental Hygiene, has announced the appointment of Dr. Richard V. Foster as assistant commissioner. Dr. Foster has been in the New York state service for 20 years, having been a member of the staffs of Rockland, Pilgrim, and Central Islip State Hospitals and director since July 1951 of Gowanda State Homeopathic Hospital. He is a diplomate of the American Board of Medical Examiners and holds certificates in both neurology and psychiatry from the American Board of Psychiatry and Neurology.

SECOND ANNUAL ALFRED KORZYBSKI MEMORIAL LECTURE.—Sponsored by the Institute of General Semantics, Lakeville, Conn., the second annual Alfred Korzybski Memorial Lecture was presented April 24, 1953, in New York City. The speaker was F. J. Roethlisberger, Professor of Human Relations, Harvard University, and his subject was "Human Relations in Industry: A Problem of Communication."

HEBREW MEDICAL JOURNAL.—The Silver Jubilee Edition of the *Hebrew Medical Journal*, *Harofé Haivri*, has been received. Established in 1927, this journal has helped to adapt the ancient Hebrew language to the needs of modern science, including medicine, and has taken a leading role in the creation of a medical terminology and literature in Hebrew. The table of contents for the 25 years of publication indicates a wide range of articles, concerned with general medicine, historical medicine, public health, biography, problems of terminology, and folklore medicine. Dr. Moses Einhorn is editor of the Journal, and the office of publication is 983 Park Ave., New York 28.

NEW YORK NEURO-PSYCHIATRIC CENTER.—This Center celebrated on April 6,

1953, its third anniversary, having been established in 1950 by Dr. William D. Sherwood, professor and chairman of the department of neurology and psychiatry at Columbia Post-Graduate Medical School and Hospital; Dr. Carl Fulton Sulzberger, chief of clinic; and Dr. John B. Scanland, assistant attending psychiatrist. The staff now comprises 20 psychiatrists, one psychologist and assistant, and 2 psychiatric social workers.

AMERICAN NEUROLOGICAL ASSOCIATION.—The 78th annual meeting of the American Neurological Association will take place June 15-17, 1953, at the Hotel Claridge, Atlantic City, N. J. Officers of the Association are as follows: president, Dr. Hans H. Reese; president-elect, Dr. Roland P. Mackay; first vice-president, Dr. Thomas K. Davis; second vice-president, Dr. James C. White; secretary-treasurer, Dr. H. Houston Merritt; assistant secretary, Dr. Charles Rupp. Councillors are Drs. George Wilson, Stanley Cobb, Henry W. Woltman, Wilder Penfield, S. Bernard Wortis, Charles D. Aring, and Francis L. McNaughton.

ELECTROSHOCK RESEARCH ASSOCIATION.—The ninth annual meeting of this Association took place on May 3, 1953, at the Mayfair Hotel, Los Angeles, Calif. The full-day meeting consisted of scientific papers on the various aspects of electroshock therapy. Dr. Philip B. Reed delivered the Presidential Address.

MID-CONTINENT PSYCHIATRIC ASSOCIATION.—This Association, which is the official district branch society of the American Psychiatric Association for the states of Arkansas, Kansas, Missouri, and Oklahoma, held its annual meeting March 28 and 29, 1953, in Kansas City, Missouri. The program included scientific papers by members and guests from Quebec, New York, Texas, and Virginia. Officers of the Association are as follows: president, Dr. Ewin S. Chappell; president-elect, Dr. Charles F. Obermann; secretary-treasurer, Dr. Paul Hines. Dr. G. Wilse Robinson, Jr., is editor of the Bulletin, and the following are councillors: Drs. Robert G. Carnahan, William F. Roth, Jr., Robert M. Bell, and Thomas R. Turner.

PSYCHIATRIC PROGRESS IN CALIFORNIA.—Referring to Dr. Thompson's review in the April 1953 JOURNAL, Dr. Milton L. Miller, president of the Institute for Psychoanalytic Medicine of Southern California, Beverly Hills, writes:

In discussing the psychiatric and psychoanalytic organizations in southern California, Dr. Thompson

omitted mentioning the Institute for Psychoanalytic Medicine of Southern California. This Institute is one of the 14 recognized affiliated Institutes of the American Psychoanalytic Association. At present, 56 psychiatrists are in analytic training. Its members and candidates actively participate in the teaching in the medical schools of this area, in the veterans' psychiatric hospitals and clinics, and in community psychiatric organizations and agencies.

OPINIONS OF DEMOCRITUS

Now his principal doctrines were these. That atoms and the vacuum were the beginning of the universe; and that everything else existed only in opinion. That the worlds were infinite, created, and perishable. But that nothing was destroyed so as to become nothing. That the atoms were infinite both in magnitude and number, and were borne about through the universe in endless revolutions. And that thus they produced all the combinations that exist; fire, water, air, and earth; for that all these things are only combinations of certain atoms; . . . and in like manner the soul is produced; and that the soul and the mind are identical; . . . and that everything that happens, happens of necessity. . . . The chief good he asserts to be cheerfulness . . . a condition according to which the soul lives calmly and steadily, being disturbed by no fear, or superstition, or other passion. . . . Everything which is made he looks upon as depending for its existence on opinion; but atoms and the vacuum he believes exist by nature. These were his principal opinions.

DIAGENES LAËRTIUS
(Lives and Opinions of
Eminent Philosophers.)

Unsere Wissenschaft ist keine Illusion. Eine Illusion aber wäre es zu glauben, dass wir anderswoher bekommen könnten, was sie uns nicht geben kann.

SIGMUND FREUD

BOOK REVIEWS

THE DEVILS OF LOUDUN. By Aldous Huxley. (New York: Harper & Brothers, 1952. Price: \$4.00.)

The three principals in this tragic-comedy of the early seventeenth century were (1) the heroine, Soeur Jeanne des Anges, prioress of the Ursuline convent at Loudun, (2) the victim, Urbain Grandier, Jesuit, vicar of Loudun, and (3) the real villain of the play, Éminence Rouge, Cardinal Richelieu himself.

At the age of 25, the diminutive, somewhat deformed, hysteric-histrionic religious, Soeur Jeanne, was made prioress of the house of Ursuline nuns that had been established at Loudun a year earlier (1626). Here she was to become the center of perhaps the most scandalous and incredible proceedings that ever disgraced a religious community. Scandalous, yes, by any gauge, incredible, by today's standards, yes (we hope), certainly credible in the sixteen-twenties.

Urbain Grandier, hedonist, was 37 when Jeanne became head of the Ursuline convent. He lived after the pattern of his calling and his time. "It is difficult," writes Huxley, "to find any medieval or Renaissance writer who does not take it for granted that, from highest prelate to humblest friar, the majority of clergymen are thoroughly disreputable." The popularity of the new priest with the women of Loudun made him somewhat less than popular with the men. Already he had seduced the daughter of his best friend, the public prosecutor, by getting himself chosen as her tutor and playing Abélard to her unsuspecting Héloïse. When the girl reported to her confessor-lover that she was *enceinte* he immediately lost interest and turned his attentions elsewhere. His best friend became his bitterest enemy. Intrigue followed intrigue and the number of Grandier's enemies increased. The primrose path was leading to the stake.

Now it came to pass that Soeur Jeanne had cast her eyes on the personable priest whose amorous exploits were common knowledge, and exclusion from the charmed circle of his favorites was an intolerable vexation of spirit. At length opportunity came for her to invite him to assume directorship of the convent. But Grandier was too busy. Jeanne's infatuation turned to malignant hatred and she aligned herself with his enemies, now a sizeable and aggressive conspiratorial group. But while she hated the parson by day she had pleasurable encounters with him in her dreams by night. These erotic adventures she related to other nuns and soon they were having similar experiences, and the contagion spread.

Next step: poltergeists and "hants." The house that had been transformed into a nunnery had the reputation of being haunted. To relieve the boredom and burden of convent life, which had been none too comfortable for the Ursulines of Loudun, certain more frolicsome members of the community capi-

talized on the legend about the house by perpetrating Halloween pranks. Phantoms appeared, covers were snatched from beds, there were mysterious groanings, rattling of chains, and other alarming disturbances.

At this point a brilliant idea struck the new spiritual director of the convent, who had his own reasons for not loving Urbain Grandier. The ghosts were honest ghosts, i.e., they were devils. The erotic dreams and hallucinations of the Mother Superior and her nuns were nothing less than visitations by incubi. In a word, the poor sisters were possessed; and the demons, with some coaching by the director and his accomplice Soeur Jeanne, laid all the blame upon the hapless Grandier.

The orthodox treatment for possession was of course exorcism, and specialists in this art were called in. It should be mentioned that clerical exorcists were quite as adept at manufacturing devils as in expelling them. It was a question of supply and demand. As the business of exorcism got under way in good earnest the number of possessed increased and the demons matched wits with the priests and exchanged blasphemies with clerical hocus-pocus. It turned out that the prioress housed 7 devils within her small frame, including the notorious Asmodeus.

The most sadistic of the professionals was a curé named Barré who adopted no half-way measures. The exorcisms must be public in order that the townspeople might enjoy the spectacle, and perhaps take warning, and that the efficacy of the ritual might thereby be enhanced. As Exhibit A Soeur Jeanne was taken in hand. The curé by suggestion induced convulsions. Jeanne rolled and writhed on the floor. A stock medical apparatus of the seventeenth century, the huge rectal syringe, was brought into play, and the prioress was forcibly given a public enema. Asmodeus fled. The whole outrageous procedure, being another indication of priestly depravity, Huxley sums up without euphemism. "Barré had treated her to an experience that was the equivalent, more or less, of a rape in a public lavatory."

The sordid tale rolls on and piles up. Bestial exorcisms continue month after month. All the nuns were possessed and were manhandled by lickerish priests. At length the secular authorities sent physicians to examine the frantic women. They "found no evidence of possession, but many indications that all or most of them were suffering from a malady to which our fathers gave the name of *furor uterinus*."

Matters finally came to a head. Grandier was accused of sorcery, of having bewitched the Ursuline nuns; and other shamelessly trumped-up charges were brought against him. It was at this point that the arch villain in the play showed his hand. The case had been referred to the king, but it was Richelieu who ruled France, and for some years the Red Cardinal had nursed a grudge against the vicar of Loudun, who on an occasion whilst Richelieu was

out of favor at Court had shown him some lack of respect. Also Grandier's enemies both lay and clerical, who did not balk at perjury, laid at his door the authorship of a scurrilous pamphlet directed against Richelieu. His Eminence was only too ready to credit the accusation.

Whatever the superstitious and vacillating Louis XIII may have believed it seems hardly likely that Richelieu was so dull-witted as to believe the devil stories the priests were preaching and the hydra-headed monster was swallowing. However, he told the King that sorcery and witchcraft must be put down; and Louis said Aye.

For Richelieu the merits of the case, considerations of justice or fair play were all unimportant, for he, as Huxley puts it, "was not concerned with fact, or logic, or law, or theology, but only with personal vengeance and a political experiment, carefully designed to show how far, in this third decade of the seventeenth century, the methods of totalitarian dictatorship could safely be pushed." The cardinal's agents and Grandier's enemies were instructed to proceed with the trial—a farcical performance of which Nazi and Communist trials are reminiscent. The verdict was determined in advance.

The author spares us none of the horrid details of the torture chamber and the place of execution, where more than 6,000 spectators watched the luckless parson being burned alive, many of them afterward scrambling among the ashes for souvenirs or relics.

It remains to say that Soeur Jeanne's demoniac exhibitions did not end with Grandier's judicial murder as they should have done, since the prioress' devil had declared that the vicar was the inciter. And now appears on the scene Jesuit Father Jean-Joseph Surin, who had been assigned to continue the exorcisms of the Mother Superior. Surin, himself a psychiatric case, was not overburdened with intellect but "his faith was glutinous and indiscriminate." He displayed an "indecent eagerness to believe." His case illustrates perhaps as well as any in history what god-intoxication can do to a weak headpiece. Father Surin struggled frantically and incessantly with Jeanne's devils but to no avail. In desperation as a last resort he prayed that the demons might pass from her body into his. They did. His long-continued "demoniac phrenzy" led, in Miltonic phrase, to "moping melancholy" and "pining atrophy" that lasted many years.

Meanwhile Soeur Jeanne had gradually got rid of her devils by her own volition. By a psychic somersault of which hysterics are capable she turned into a contemplative saint. She prayed by the hour. She became the center of miraculous happenings. Her left hand was stigmatized with names of the holy family, renewed from time to time (the author implies that Jeanne was right-handed).

Loudun was a little town, and although tourists had flocked there from all parts of Europe to witness the orgies of exorcism, Soeur Jeanne felt that it offered too narrow a stage for an actress of her talents. She made a triumphal tour of the large cities; she was the attraction of the continent.

At length she died in the odor of sanctity; not,

however, before she had written her memoirs. Should anyone suspect that the picture of devil possession in Loudun is overdrawn in the lively language of Huxley's thoroughly documented book, he has only to consult this amazing autobiography of Soeur Jeanne des Anges, the manuscript of which was found in the library of Tours, was prepared for the press by Doctors Legue and Gilles de la Tourette and published with a preface by Charcot in 1886.

The Rev. Father Sinistrari of Ameno was contemporary with the events recorded in "The Devils of Loudun," and his treatise, "Demoniality or Incubi and Succubi," may be regarded as a companion piece to Jeanne's autobiography. The mental twistings and turnings of Sinistrari's book are all but incredible, but there they are for the light they throw on medieval ecclesiastic authority.

If further evidence were needed one might turn to the ultimate authority, presumably the wickedest book ever written, the fifteenth century *Malleus Malificarum*, textbook of the Holy Inquisition.

Reviewing all this tohu-vohu of superstition and credulous religiosity, exhibitionism, exploitation and political skulduggery, sadism, obscenity, hocus-pocus and hysteria, we conclude with Huxley: "Credulity is a grave intellectual sin, which only the most invincible ignorance can justify."

C. B. F.

TRAUMA, GROWTH, AND PERSONALITY. By Phyllis Greenacker. (New York: W. W. Norton & Co. Inc., 1952. Price: \$4.50.)

The book consists of 14 chapters, 13 of which have appeared previously in various psychiatric journals. The first and second chapters, dealing with "The Biological Economy of Birth" and "The Predisposition to Anxiety" respectively, are the most interesting. On the basis of neurological observations on foetal reflexes and of psychoanalytic experiences, the author arrives at a biopsychological interpretation of the birth process. Birth is the period of organization and patterning of the somatic components of the anxiety response. It organizes the anxiety pattern by fusing together the genetically and individually determined elements. The anxiety response manifests itself in foetal life as a set of separate or loosely constellated reflexes. Cardiovascular and respiratory components are added at birth. Variations in the birth process may increase the organic anxiety response and heighten the anxiety potential. This may cause more severe reactions to psychological danger later in life. An increase in early anxiety is paralleled by an increase in narcissism, which in turn favours inadequate development of the sense of reality and furnishes additional predisposition to severe neuroses or borderline states.

The other chapters deal with special problems of psychoanalytic work, such as the infant's reactions to restraint, urination, and weeping, etc. The theoretical considerations are supported and exemplified by clinical and analytical case histories.

V. A. KRAL, M. D.,
Verdun Protestant Hospital,
Montreal.

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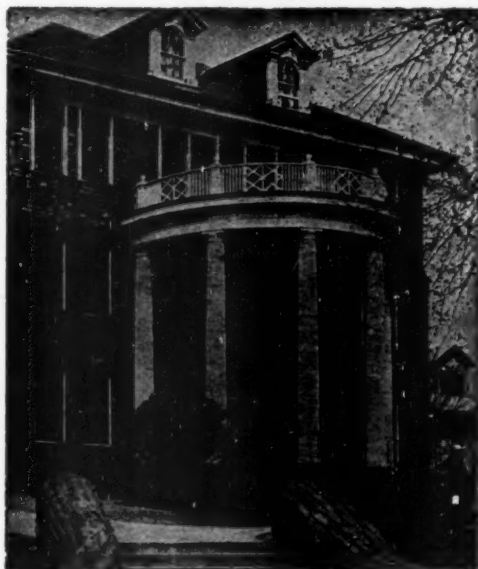
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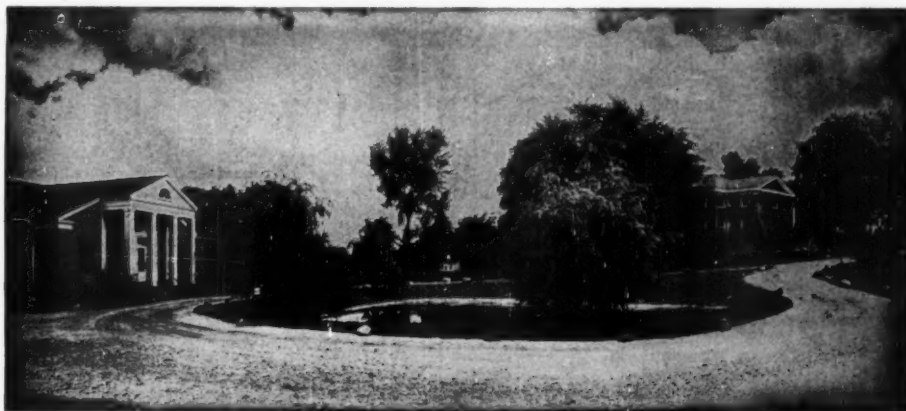
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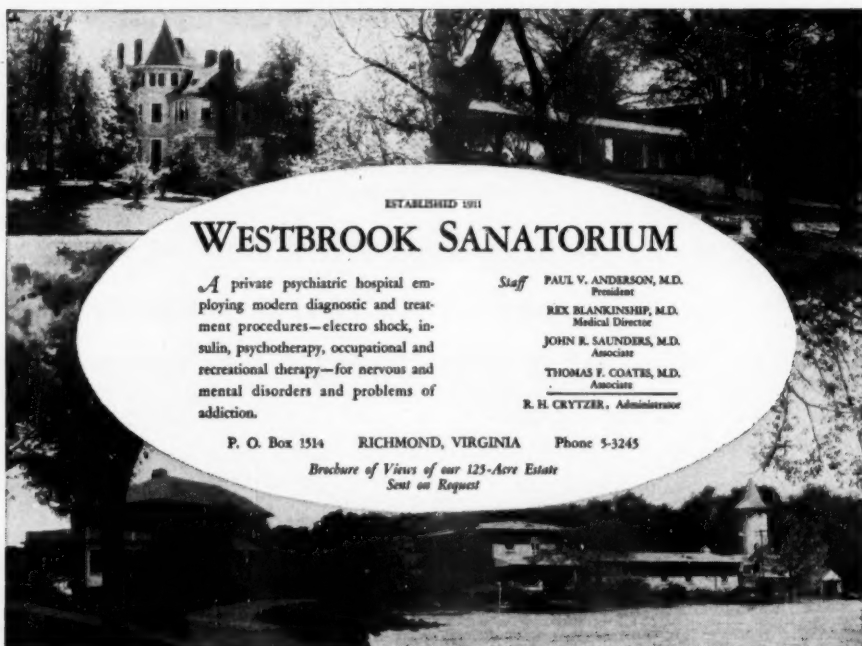
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